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GARY W. OTT
RECORDER, SALT LAKE COUNTY, UTAH
MERIDIAN TITLE
64 E WINCHESTER #100
MURRAY UT 84107
BY: MGB, DEPUTY - WI 67 P.

By: MGB

WHEN RECORDED MAIL TO:
Salt Lake County Real Estate Division
2001 S. State # N-4500
Salt Lake City, UT 84190

67

CONSERVATION EASEMENT AND RESERVATION OF RIGHTS

This Conservation Easement and Reservation of Rights (the "Easement") is executed this 20 day of August, 2008, by and between Sandy City, a Utah municipal corporation ("Sandy City" or "Grantor"), and Salt Lake County, a political subdivision of the State of Utah ("County" or "Grantee").

RECITALS

WHEREAS, Sandy City is the owner of certain tracts of real property located in Salt Lake County, State of Utah, known as Willow Canyon, which property is more particularly described in Exhibit "A" attached to this Easement and by reference is incorporated (the "Property").

WHEREAS, This Easement is being granted for the purpose of preserving and maintaining the Property predominantly in an open condition while permitting passive recreational use, all for the benefit of the public and the residents of County and Sandy City.

WHEREAS, the property possesses natural, scenic, open space, historical, educational, aesthetic, and recreational values (collectively, "Conservation Values") of great importance to Sandy City and County; and

WHEREAS, the specific conservation values of the Property are documented in an inventory, hereinafter referred to as the Baseline Documentation, attached in part as Exhibit "B" (the "Specific Conservation Values"); and

WHEREAS, the Property provides access to and includes a section of the Bonneville Shoreline Trail, which has regional and local significance as a recreational amenity; and

WHEREAS, the Property is valued by the community as peaceful urban open space; and

WHEREAS, the Property contains Little Willow Creek, which is an important water resource; and

WHEREAS, the Property provides important wildlife habitat for a wide variety of species; and

WHEREAS, the Property is a visual and physical buffer between urban development and the benches and slopes of the Wasatch Mountains; and

WHEREAS, the Grantor intends that the Conservation Values of the Property including, without limitation, those relating to the Property's open space, passive recreational, natural conservation resource value, and public access be preserved and maintained; and

WHEREAS, the Grantor further intends, as the owner of the Property, to convey to the Grantee the right to preserve and protect the open space and Conservation Values of the Property in perpetuity; and

WHEREAS, The Property will provide a substantial recreational open space for the current and future residents of County and Sandy City, and such use is consistent with the protection of open land and will contribute to the scenic enjoyment by the public.

NOW, THEREFORE, for good and valuable consideration, the receipt, adequacy and legal sufficiency of which is acknowledged, Sandy City hereby grants the following Easement to County:

1. Purpose. It is the purpose of the Easement to assure that the Property, as described in Exhibit "A" & "B," will be retained in its natural, scenic, passive recreational, and open space condition and to prevent any use of the Property that will significantly impair or interfere with the Conservation Values of the Property. Specifically, Grantor intends that this Easement will limit the use of the Property to such activities as are consistent with the purposes of this Easement, including, without limitation, those involving public access and passive recreation, scenic enjoyment, education, ecological restoration, and protection of wildlife habitat. This Easement is granted to prevent any use of the Property that will impair, interfere with or be inconsistent with the foregoing.

2. Definitions. In addition to the terms defined above in this Easement, the following terms shall have the meanings set forth.

a. "Recreational use" means recreational activities such as hiking, studying nature and other such activities associated with natural open space.

b. "Mortgage" means a recorded mortgage, deed of trust or other security agreement creating a lien on the Property.

c. "Mortgagee" means the mortgagee, beneficiary or other secured party under a Mortgage.

d. "Occupant" means any Person that, by virtue of a contract to purchase, a lease, a rental arrangement, a license or any other instrument, agreement, contract document, understanding arrangement is entitled to or does occupy, possess or use the Property or any portion of the Property.

e. "Owner" means the Person that, at the time concerned, is the owner of record in the office of County recorder of Salt Lake County, Utah of a fee or an

undivided fee interest in the Property or any portion of the Property. In the event there is more than one owner of the Property or any portion of the Property involved at the time concerned, the liability of each such Owner for performance or compliance with the applicable provisions of this Easement shall be joint and several. Notwithstanding any applicable theory relating to a mortgage, deed of trust, or like instrument, the term "Owner" shall not mean or include a Mortgagee and until such Person has acquired fee title pursuant to foreclosure, trustee's sale or any arrangement or proceeding in lieu thereof.

f. "Person" means a natural person or a legal entity.

3. Grant of Easement. Subject to Section 4 below, Sandy City hereby grants to County a perpetual easement for the purpose of preserving the Property in a natural, open and scenic condition for passive recreational use consistent with the protection of open land and consistent with the purposes described in Section 1, above. County shall have the right, at its sole risk and expense, to enter the Property at reasonable times and upon reasonable notice to the Owner of the Property, for the purposes only of inspecting the Property and assessing compliance with the terms of this Easement. Except for those uses expressly provided for in this Easement and subject to the reservations set forth in Section 4 below, the Property shall be limited to use as open space for the enjoyment of the public.

4. Reserved Rights. Sandy City shall have the exclusive and non-terminable right to develop, construct, operate and maintain the open space on the Property from time to time, which includes completion of a section of the Bonneville Shoreline Trail subject to and consistent with the purpose of this Easement as described in Section 1 above, and Section 3 above, and Sandy City ordinances.

5. Prohibited Uses. Any activity on or use of the Property inconsistent with the purposes of this Easement is prohibited. Prohibited uses shall include the following as long as they are not inconsistent with Section 1 or Section 4, above.

A. No buildings or improvements of any kind may be constructed, built maintained or operated on the Property at any time except for those that are consistent with the purposes of the Easement and serve to enhance and maintain the natural open space values of the Property; and

B. Use of motorized vehicles, including motorcycles, all-terrain vehicles, and snowmobiles, except for security, emergency, and maintenance purposes and as otherwise specifically permitted under this Easement; and

C. Construction, expansion, relocation or location of any structure except for structures specifically permitted under this Easement; and

D. Changing the topography of the Property by placing on or removing any soil, dredging spoils, land fill, or other material except as needed and approved by

the Owner and Grantee to meet the purpose of the Easement and as defined in Section 6 below; and

E. Changing, disturbing, altering, or impairing the significant relatively natural ecological features or the destruction of other significant conservation interests on or the Conservation Values of the Property; and

F. Development, pre-sale, division, subdivision, or defacto subdivision (through long term leasing or otherwise) of the Property for any type of human occupation; and

G. Construction of buildings, residences, mobile homes, or other structures, or any other improvements constructed or placed in, on, under, or upon the Property except to the extent provided in Paragraph 4; and

H. New telephone, telegraph, cable television, electric, cellular phone towers, gas, water, sewer, or other utility lines nor a utility corridor or easement routed over, through, under, in, or upon the Property; and

I. Quarrying, mining, excavation, depositing, or removing of rocks, gravel, minerals, sand, or other similar materials from the Property; and

J. Construction of any roads, except as existing on the Property; and

K. Exploration, drilling for or production of oil, gas, or other hydrocarbons; and

L. Mining or removal of groundwater for use off of the property including, but not limited to the sale, removal or transfer of water rights and shares for use off of the Property unless expressly agreed to by Grantee; and diking, draining, filling or altering of bodies of water; and

M. Swimming, in any pond, stream, canal, or wetland feature; and

N. Maintenance of any livestock or domestic animals on the property, such as sheep, goats, horses, chickens, geese, ducks, or ornamental fish; and

O. Dumping, depositing, abandoning, discharging, storing, maintaining, or releasing any gaseous, liquid, solid or hazardous wastes, substance, materials, pollutants, or debris of whatever nature on, in or over the ground or into surface or ground water of the Property; and

P. Placement, erection, or maintenance of signs, billboards, or outdoor advertising structures on the Property except for a reasonable number of signs for the following purposes:
    a. to state the name of the Park, or any portion thereof; and

b. to post the Property with appropriate recreational and resource interpretive signs and signs posting rules and restrictions.

Provided, however, this sub-Paragraph (P) shall not limit the right of Grantee to display on the Property, at its discretion, such sign as it may customarily use to identify lands under conservation easement, the terms of such easement and that the Easement was purchased using bond proceeds from the Parks and Open Space Bond. All locations of Grantee's signs shall be subject to approval by Sandy City; and

Q. No hunting shall be allowed on the property; and

R. All other uses and practices inconsistent with and significantly detrimental to the stated objectives and purposes of the Easement and shall be in accordance with Sandy City's rules and regulations governing property owned by Sandy City and used in the manner identified in this Easement.

6. Notice and Approval of Grantor's Activities. Grantor shall not undertake or permit any activity requiring prior approval by the Grantee without first having notified and received approval from the Grantee as provided herein. Sandy City will consult with and receive approval from Salt Lake County's Parks and Recreation Division on any proposed improvements on the Property, such as trail construction, landscaping, or other improvements that alter the condition of the Property.

7. Enforcement of Easement.

A. Sandy City, and their successors in interest, shall notify Grantee, or its successor in interest, in writing, before exercising any right reserved by Sandy City or its successors in interest, expressly or impliedly, with respect to the Property or the exercise its right to make changes to the Property from its original condition which may have a significant impact on any of the Conservation Values associated with the Property. Said notice shall inform Grantee of all aspects of the proposed activity including, but not limited to, the nature, magnitude, and anticipated effect of the proposed activity or use with respect to the purpose of the Easement. Such notice shall be sent by registered or certified mail, return receipt requested, addressed to the following:

Salt Lake County Mayor
2001 South State Street, N2100
Salt Lake City, UT 84190-1000

with copies to:

Salt Lake County Real Estate Division
2001 South State Street, N4500
Salt Lake City, UT 84190-3100

or to such other address as Grantee may designate.

B. Grantee shall have ninety-(90)-days from the mailing of such notice to review the proposed activity and notify Sandy City, or their successors in interest, of any

objections thereto. Such objections, if any, shall be based upon Grantee's opinion that the proposed activity is inconsistent with this Easement, and shall inform Sandy City, or their successors in interest, of the manner, if any, in which the proposed activity can be modified to be consistent with the Easement. Grantee shall have the right to prevent any proposed activity, which is incompatible with the authorized uses or prohibitions specified herein. If notice of Grantee's objection is not given to Sandy City, or its successors in interest, as required by Paragraph 7 (A), within ninety-(90)-days to Sandy City, or its successors in interest, mailing its notice of a proposed activity, Grantee shall have waived its right to object to the proposed activity.

C. Regardless of receipt of notice, if Grantee determines that Sandy City, or their successors in interest, are in violation of the terms of this Easement, Grantee shall give written notice to Sandy City, or its successors in interest, of such violation and demand corrective action sufficient to cure the violation and where this violation has injured the Property because of a use or activity inconsistent with this Easement, to restore the Property the extent possible to the condition of the Property before the violation occurred as documented in the Baseline Documentation. The Parties recognize that Grantee may bring an action in law or equity in a court of competent jurisdiction to enforce the terms of this Easement, enjoin violations, or require restoration of the Property, as needed.

D. Any violation of the Easement shall be subject to injunctive proceedings with the imposition of temporary restraining orders or through any other legal means. The Parties recognize that monetary damages and/or other non-injunctive relief are not an adequate remedy of violations of the covenants and restrictions of this Easement, and will not return the Property to the condition that existed at the time this Easement was signed.

E. In the event of disputes as to any permitted or prohibited use of the Property, Grantee and Sandy City, or their successors in interest, shall have the right to demand arbitration by making such demand in writing upon the initiator of the dispute. Arbitration shall proceed under the rules of the American Arbitration Association. In the event that Grantee or Sandy City, or their successors in interest, exercise this right, if Sandy City, or their successors in interest, and Grantee agree upon selection of one person to serve as arbitrator, there shall be only one (1) arbitrator. If no agreement is reached within fifteen-(15)-days after the demand for arbitration, there shall be three (3) arbitrators, one named by Grantee and one named by Sandy City, or their successors in interest, within thirty-(30)-days after the demand for arbitration and a third chosen by those two designated arbitrators. The decision of the arbitrator (or a majority of the arbitrators, as the case may be) shall be binding. Should Sandy City or Grantee, or their respective successors in interest, refuse or neglect to timely appoint an arbitrator, a binding decision shall be rendered solely by the arbitrator named by Grantee or Sandy City, or their respective successors in interest.

F. Failure by any party to exercise its rights under this instrument in the event of any breach shall not be deemed or construed to be a waiver of the Parties' rights hereunder as to that breach or any subsequent breach.

8. Amendment of Boundaries of Property. Sandy City shall not have the right expand or reduce any boundary of the Property without the prior written consent of County.

9. Effect on Mortgages. Except to the extent such right or easement shall violate this Easement, this Easement shall not limit or restrict the right of Sandy City or its successors or assigns to execute, deliver and record Mortgages on the Property or to grant other rights or easements in respect of the Property. The lien or security interest of each Mortgage and each easement or other right created subsequent to the date hereof shall be subject and subordinate to this Easement.

10. Covenants to Run with Land. This Easement and the restrictions and covenants created herein are covenants running with the land and shall be binding upon each Owner, Occupant, and any other Person who acquires or comes to have any interest in the Property; and their respective grantees, transferees, lessees, heirs, devisees, personal representatives, successors, and assigns. Each Owner and Occupant shall comply with, and all interests in the Property shall be subject to, the terms of this Easement. By acquiring, or in any way coming to have an interest in the Property, the Person so acquiring or coming to have such interest in the Property, shall be deemed to have consented to, and shall be bound by, each and every provision of this Easement. County shall have the right to enforce the restrictions set forth herein by appropriate legal proceedings.

11. Payment of Costs, Taxes or Assessments. Sandy City or their successors in interest, shall bear all costs and liabilities of operation, upkeep and maintenance of the Property, including the maintenance of adequate general liability insurance coverage. Sandy City or their successors in interest shall pay all real estate taxes or assessments levied by competent authorities upon the Property, and Grantee shall have no obligation or responsibility for payment of taxes or assessments levied upon any of the Property. All obligations of Sandy City under this Easement, if more than one person or entity is the successor or assign of Sandy City shall be jointly severally binding on each such person or entity.

12. Amendments: Termination. If circumstances arise under which an amendment to or modification of this Easement would be appropriate, Sandy City and Grantee may by mutual written agreement jointly amend this Easement; provided that no amendment shall be made that will adversely affect the qualification of this Easement under any applicable laws, including Sections 170(h) and 501(c)(3) of the United States Tax Code and the laws of the State of Utah. Any such amendment shall be consistent with the purpose of this Easement, shall not affect its perpetual duration, shall not permit residential, commercial or industrial development of the Property and shall not permit any impairment of the significant Conservation Values of the Property. Any such amendment shall be filed in the Recorder's office of County Salt Lake City, Utah. Nothing in this paragraph shall require Grantor or Grantee to agree to any amendment or to consult or negotiate regarding any amendment.

13. Governmental Immunity. County a body corporate and politic of the State of Utah and Sandy City is a municipal corporation and both parties are subject to the Utah Governmental Immunity Act ("Act"), Utah Code Ann. §§ 63G-7-101, et. seq. (1953, as amended). The Parties agree that each of them shall only be liable within the parameters of the Governmental Immunity Act. Nothing contained in this Easement shall be construed in any way, to modify the limits of liability set forth in that Act or the basis for liability as established in the Act.

County represents that it is self-insured pursuant to the provisions of Section 63-30d-801 of the Utah Code.

14. Titles, Captions and References. All section titles or captions in this Easement are for convenience of reference only, shall not be deemed part of this Easement and in no way define, limit, extend or describe the scope or intent of any provision of this Easement.

15. Program and Plurals. Whenever the context may require, any pronoun used in this Easement shall include the corresponding masculine, feminine or neuter forms, and the singular form of nouns, pronouns and verbs shall include the plural and vice versa.

16. Applicable Law. This Easement shall be construed in accordance with and governed by the laws of the State of Utah.

17. Exhibits. All exhibits attached to or otherwise referenced in this Easement are expressly made a part of this Easement as fully as though set forth in this Easement.

18. Change of Conditions. The fact that any use of the Property expressly prohibited by this Easement or otherwise determined inconsistent with the purpose of this Easement may become significantly more valuable or economical than permitted uses, or that neighboring properties may in the future be put entirely to uses inconsistent with this Easement, has been considered by Grantor in granting this Easement. It is Grantor's belief that any such changes will increase the public's benefit and interest in the continuation of this Easement, and it is the intent of both Grantor and Grantee that any such changes not be considered circumstances sufficient to terminate this Easement, in whole or in part. In addition, the inability to carry on any or all of the permitted uses, or the unprofitability of doing so, shall not impair the validity of this Easement or be considered grounds for its termination.

19. Hold Harmless. Consistent with paragraph 13 above and the Governmental Immunity Act, Sandy City, or its successors in interest, will hold harmless, indemnify and defend Grantee and its officers, employees, agents and contractors and its successors, and assigns (collectively "Indemnified Parties") from and against all liabilities, penalties, costs, losses, damages, expenses, causes of action, claims, demands, or judgments, including, without limitation, arising from or in any way connected with: (1) injury to or the death of any person, or physical damage to any part of the Property, resulting from any act omission, condition, or other matter related to or occurring on, or about the

Property, regardless of cause, unless due solely to the negligence of any of the Indemnified Parties; (2) the obligations specified in Paragraph 7; (3) the existence or administration of this Easement; and (4) any presence or alleged presence of any hazardous substance, hazardous waste, here taken in the broadest context, cleanup resulting from previous landfills, dumping, toxic refuse or other waste for which the Superfund Act may be applied.

20. Construction. Any general rule of construction to the contrary notwithstanding, this Easement and this Easement shall be liberally construed in favor of the Easement and to effect the purpose of this Easement and the policy and purpose of Utah Code Ann. §57-18-1, et seq. (1985) and related provisions. If any provision in this instrument is found to be ambiguous, an interpretation consistent with the purpose of this Easement that would render the provision valid shall be favored over any interpretation to the contrary.

Grantor:
CITY OF SANDY

By: _____
Mayor or Designee

ATTEST:

_____, City Recorder

APPROVED AS TO FORM:

_____, City Attorney

SANDY CITY, UTAH INCORPORATED 1893

Grantee:
SALT LAKE COUNTY

By: _____
Mayor or Designee

APPROVED AS TO FORM
Salt Lake County District Attorney's Office
By _____
Deputy District Attorney
Date 8-18-08

STATE OF UTAH)
:ss.
COUNTY OF SALT LAKE)

On this 20 day of August, 2008, personally appeared before me Doug Willmore, who being duly sworn, did say that (s)he is the CAO of Salt Lake County, Office of Mayor, and that the foregoing instrument was signed on behalf of Salt Lake County, by authority of law.

KAREN R. LOWE
NOTARY PUBLIC - STATE OF UTAH
2001 S. STATE STREET N-2100
SALT LAKE CITY, UT 84190
My Comm. Exp. 01/08/2010

[SEAL]

Karen R. Lowe
NOTARY PUBLIC
Residing in Salt Lake County

EXHIBIT A

The Northwest Quarter of the Northwest Quarter of the Northwest Quarter of Section 26, Township 3 South, Range 1 East, Salt Lake Base and Meridian, in Salt Lake County, Utah.

PARCEL NO: 28-26-100-001

EXHIBIT B

Willow Canyon

Baseline Documentation

July 28, 2008

Prepared by

Lorna Vogt
Open Space Program Manager
Salt Lake County

And

Arthur Morris, PhD
Conservation Stewardship Director
Utah Open Lands Conservation Association

Contents

This baseline documentation was developed from actual site visits by Salt Lake County Open Space Program Manager, Lorna Vogt, and Utah Open Lands Ecologist/Conservation Stewardship Director, Arthur Morris (May 20 and July 21, 2008). This Baseline Documentation is to be used in conjunction with the Willow Canyon Conservation Easement. This Baseline Documentation will be updated during monitoring visits.

List of Figures

List of Tables

Property location and identification

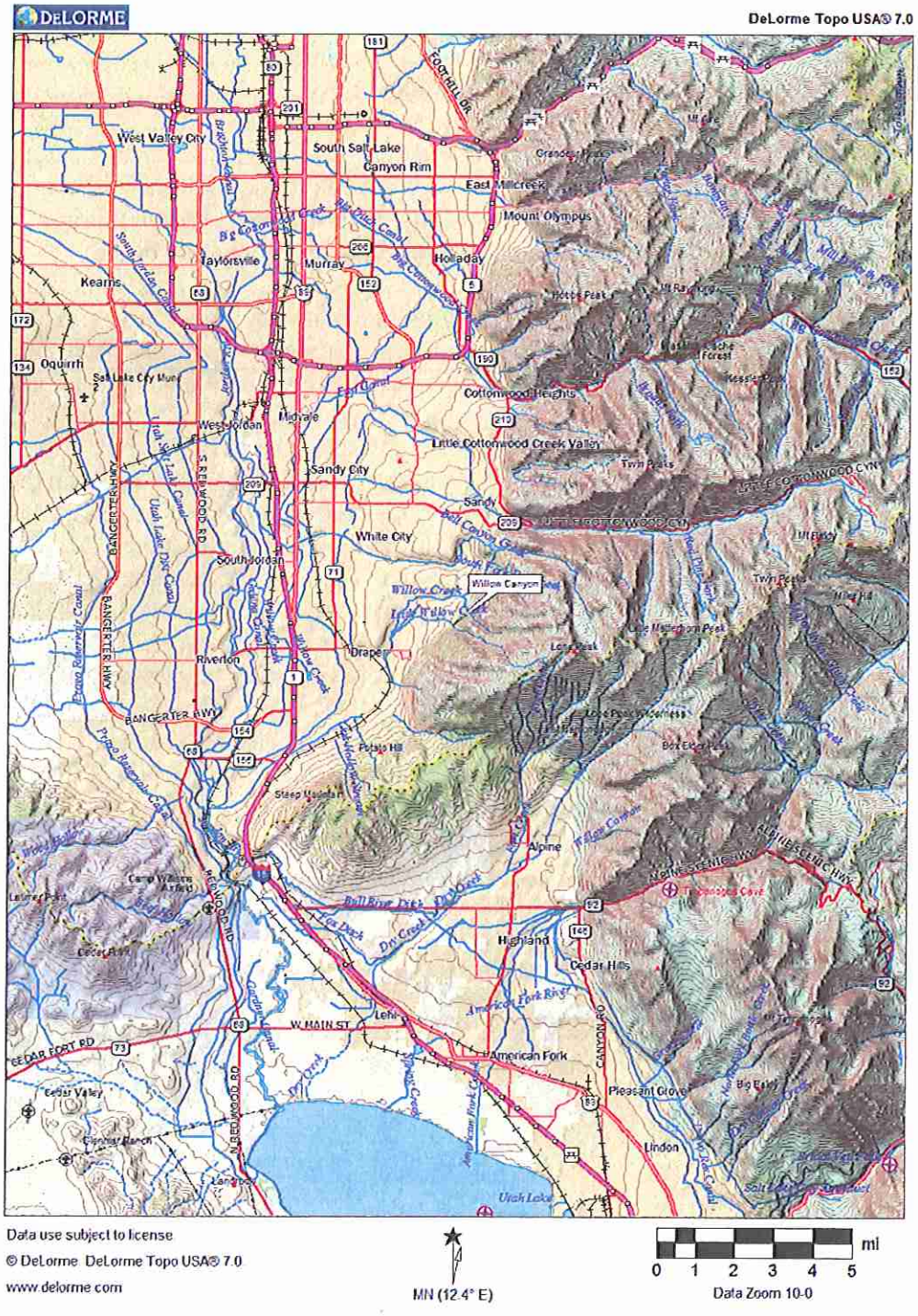

Figure 1. Locator map for the Willow Canyon Property

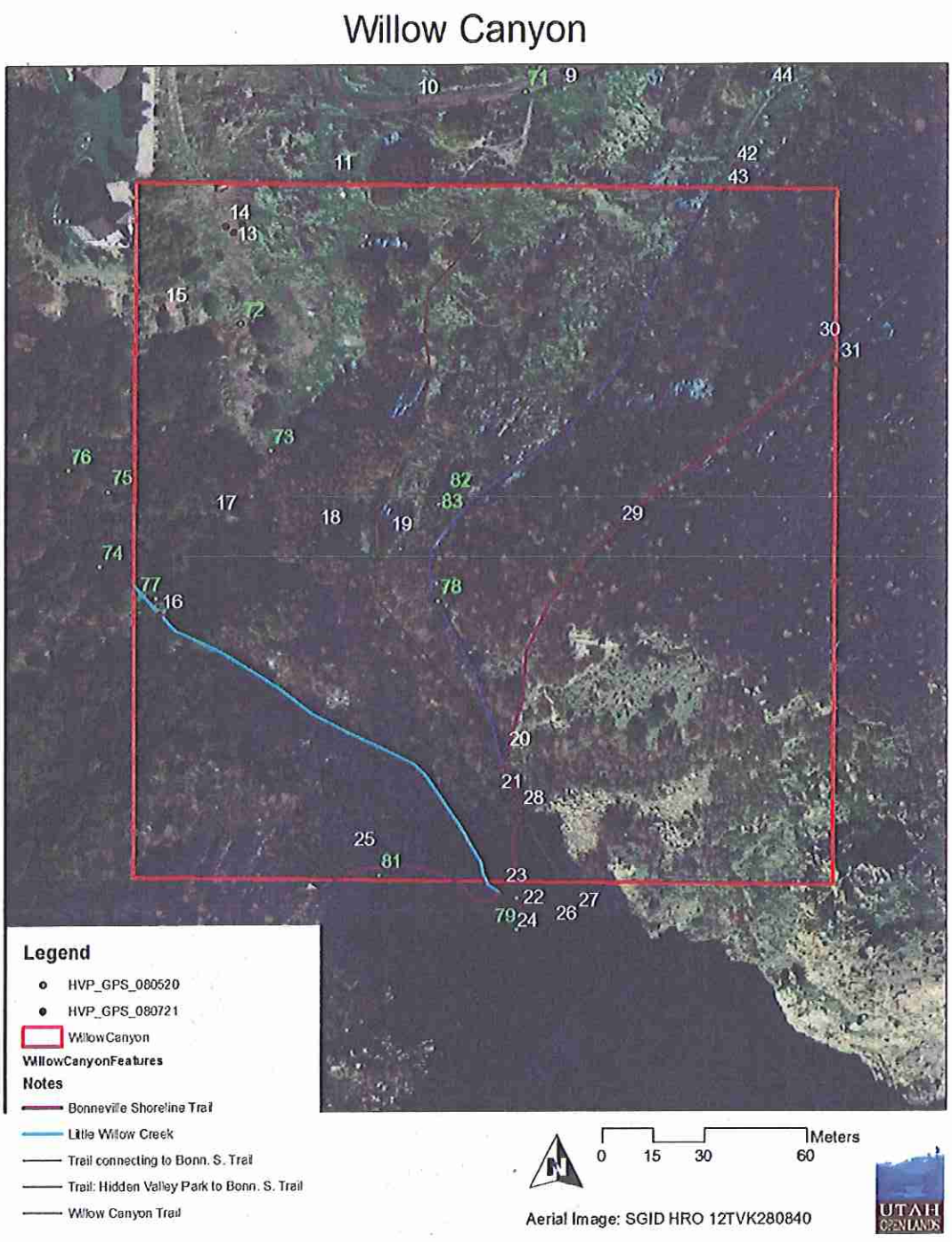

Figure 2. 2006 aerial photo of Willow Canyon Property. Numbered points indicate locations from which photos were taken: green labels - May 20, 2008, white labels - July 21, 2008. In this and other figures, more photopoints are shown than for photos in this baseline document. Additional photos are on file with Salt Lake County Open Space Program.

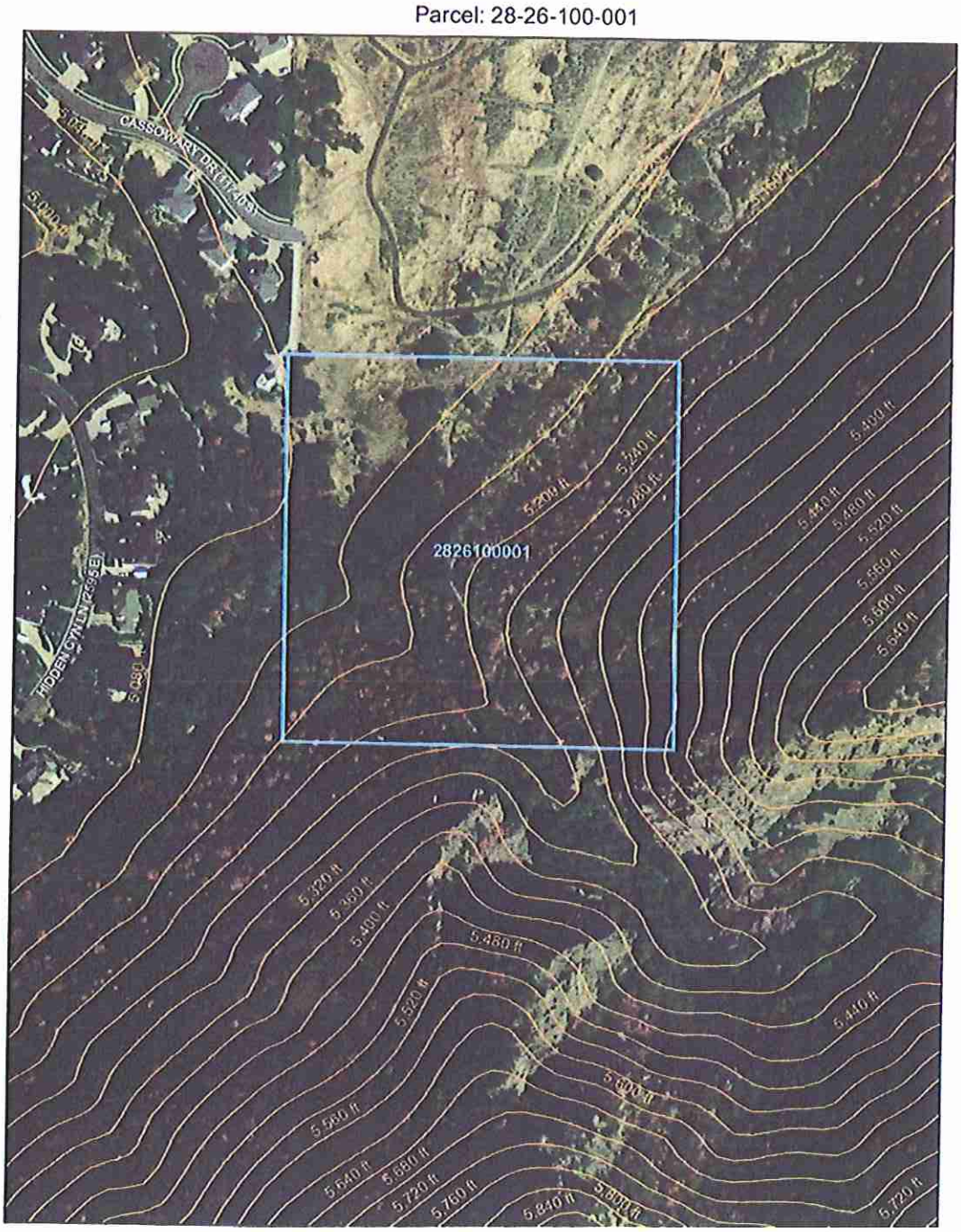

Figure 3. Topography of the Willow Canyon Property (parcel 2826100001).

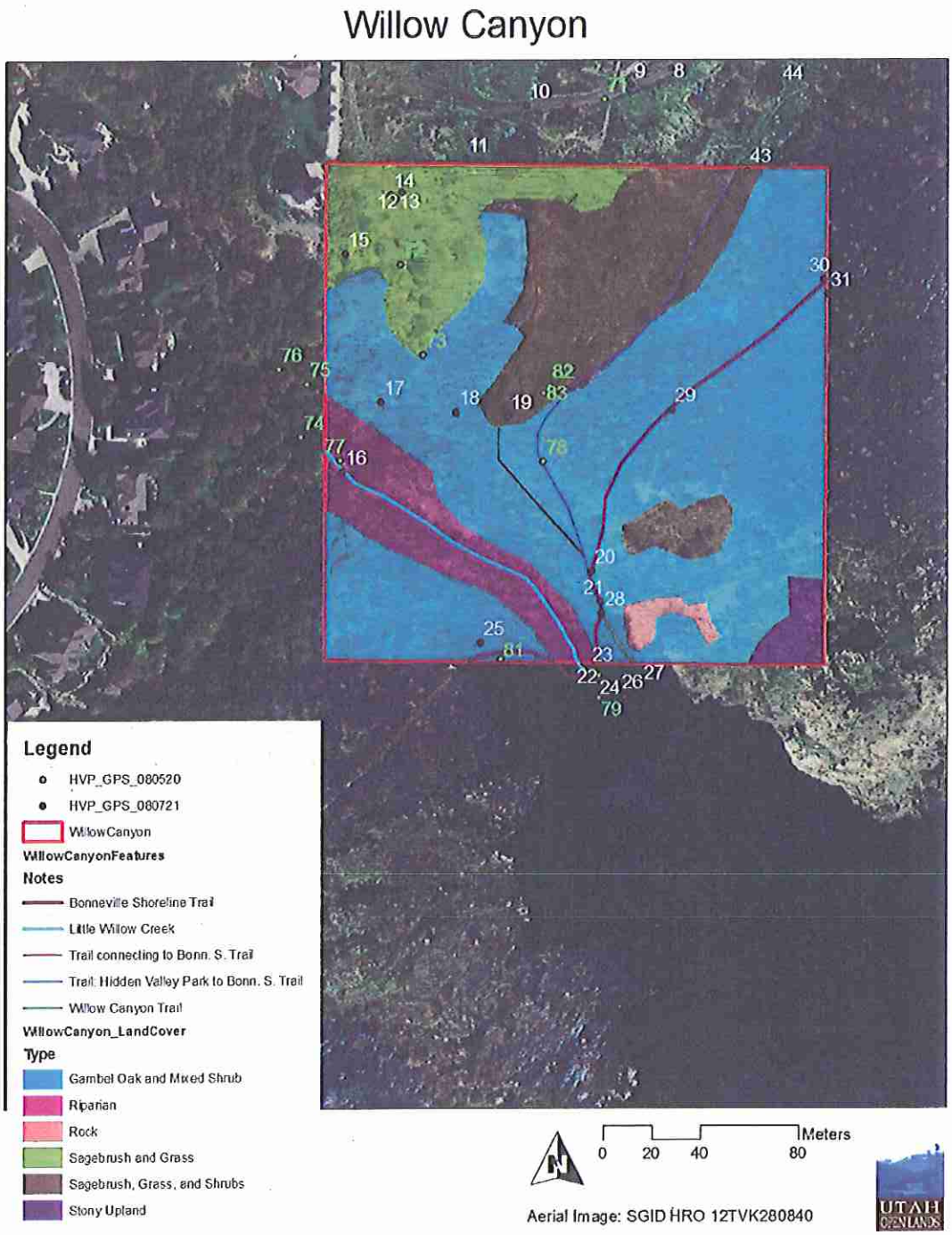

Figure 4. Landcover map for Willow Canyon Property.

GENERAL

Land Type

The open land described in this baseline documentation is termed the Willow Canyon Property (Hereafter also "the Property"). The Willow Canyon Property is approximately 10 acres. It is located in the northwestern corner of Section 26 in Township 3 South, Range 1 East, Salt Lake base and meridian, near the terminus of Cassowary Drive, in Draper City (Figures 1 through 3). The exact parcel description is recorded in the Deed of Conservation Easement.

The Willow Canyon Property is a relatively natural area adjacent to the Hidden Valley Park. Little Willow Creek and the Bonneville Shoreline Trail cross the Property. Much of the Property is steep, with slopes in excess of 30 degrees. The Lake Bonneville bench cuts across the hillside in the eastern portion of the Property; it is along this bench that the popular Bonneville Shoreline Trail is found (Figure 5). The narrow, rocky cut of Little Willow Canyon bisects the Lake Bonneville Bench and forms a dominant landscape feature on the Property (Figure 6). Little Willow Creek runs in the canyon, and is associated with abundant riparian vegetation across the Property (Figure 7). Little Willow Creek is identified as a perennial stream in Salt Lake County's DRAFT Water Quality Stewardship Plan[1]. Vegetation on the Willow Canyon parcel includes Gambel oak (*Quercus gambelii*), bigtooth maple (*Acer grandidentatum),* chokecherry (*Prunus virginiana*), big sagebrush (*Artemisia tridentata*), boxelder (*Acer negundo,*), and other grasses and herbaceous plants that function as food sources and shelter for birds and other wildlife as well as winter range for mule deer (Figure 8). The northwestern corner of the property is fairly level and sits slightly below the grade of Cassowary Dr. and the closest home; this more level area would be a likely area for additional house building. However, the level area of the Property lies between Little Willow Creek and the Hidden Valley Park and is therefore a key connection between the natural areas of the Park and valuable stream and riparian habitat (Figure 9). The open spaces of the Property and Hidden Valley Park together form a more valuable natural area than either one separately.

[1] http://www.waterresources.slco.org/pdf/WaQSPHydroModMap.pdf

Table 1. Willow Canyon approximate acreage*

LANDCOVER	ACRES	%
Gambel Oak-Mixed Shrub	6.2	60.5
Sagebrush, Grass, and Shrubs**	1.7	16.9
Sagebrush and Grass	1.2	11.3
Riparian***	0.9	8.5
Stony Upland	0.2	1.8
Rock	0.1	1.0
Total	*10.3*	

Notes:
**Acreage was calculated from polygons drawn in ArcMap on a 2006 High Resolution Orthophotograph (HRO; 12TVK280840.jpg; Figure 4) obtained from the Utah Spatial Geographic Information Database (SGID).*
*** The Sagebrush, Grass, and Shrubs category represents the transition between Gambel oak and sagebrush/grass communities; this transition generally corresponded with the topographical transition between steep hillsides and flatter base lands.*
**** Riparian landcover contained plant species similar to uplands. Riparian extents were estimated from field observations and HRO based on vegetation denseness and height.*

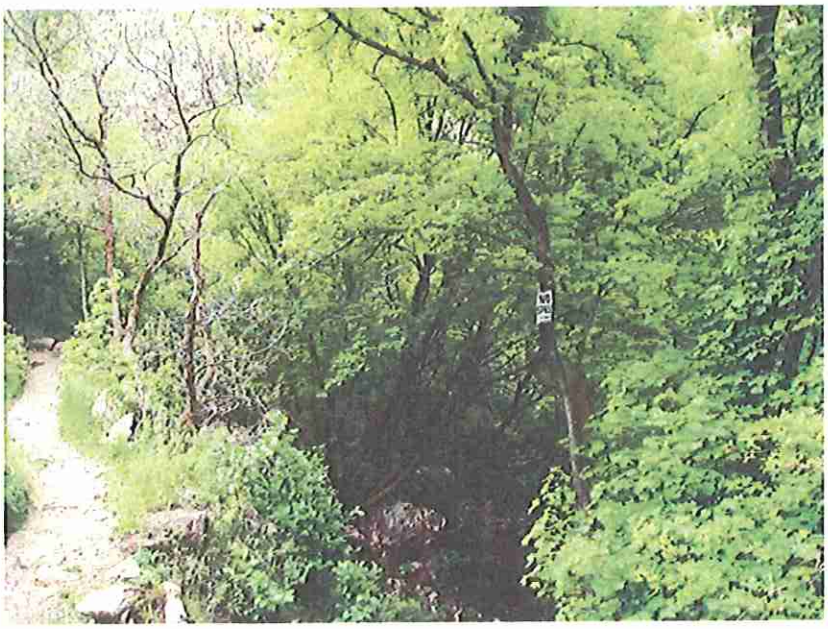

Figure 5. Looking south from the Bonneville Shoreline Trail into riparian vegetation along the north side of Little Willow Creek. (80; in this and subsequent photos photopoints are indicated in parentheses)

Figure 6. Looking southwest across the Property to Little Willow Canyon. (15)

Figure 7. Little Willow Creek looking upstream. A diversion gate has been installed here at the creek, but it was closed during baseline observations. (16)

Property Access

Willow Canyon is accessed through Hidden Valley Park (Cassowary Drive or Wasatch Boulevard) and along the Bonneville Shoreline Trail.

Figure 8. Looking south toward the riparian area along an informal trail. (18)

Conservation Values

The Property provides a unique open space along the heavily developed eastern edge of Salt Lake County. It is an important buffer between the developed areas and the foothills and slopes of the Wasatch Mountains. The Willow Canyon parcel is a valuable open space serving as a buffer to the entrance of Little Willow Canyon and protecting Little Willow Creek; providing important habitat, including riparian vegetation; and creating a scenic viewshed both of the Salt Lake valley and the Wasatch Mountains. The Willow Canyon property is identified in Salt Lake County's Open Space Acquisition Plan as in the top ten percent of priority parcels to acquire based on its ecological, hydrological, and recreational values[2].

Conservation values of the Willow Canyon include:

1. **Public Recreation.** The Bonneville Shoreline Trail on the Property is suited for recreational activities such as walking, jogging, bicycling, bird watching, photography, artwork, strolling with children, etc., or relaxing with a beautiful

[2] http://www.openspace.slco.org/html/Acquisition_Plan.html

view of the mountains and the valley. The relatively natural area throughout the property provides areas for exploration, refuge from urban congestion, places to enjoy the sounds of the stream, and places for birdwatching, photography, contemplation, reading, and outdoor play, as well as access into Little Willow Canyon.

2. **Public Education**: The Property can facilitate outdoor and experiential learning. The Property provides natural "classrooms" with abundant teaching resources in the form of geologic materials, plants, and animals. The Property is well-suited for the teaching of science (e.g., biology, botany, ecology, etc.), art, reading, writing, physical education, and any other subject for which an outdoor, open setting can improve learning. The Property preserves a readily accessible, relatively natural representation of a foothill ecotone which is also at the interface between mountains and urban development.

3. **Cultural**: The Property provides a place that can be used as a refuge for family and group activities, such as Boy Scout and Girl Scout meetings or family games. The Property improves the quality of life by providing public open space which includes relatively natural plants and wild animals and which also facilitates visual and physical access to other natural areas.

4. **Scenic**: The Property provides visual beauty at the landscape scale as well as smaller scales.

5. **Natural**: The property preserves a relatively natural riparian area and adjacent hillsides with vegetation such as native Gambel oak, and mountain shrubs; such native vegetation supports varied ecological interactions. Riparian habitats are considered the highest priority habitats for conservation in Utah because of their values to plants, wildlife, and people (Parrish *et al.* 2002, Gorrell *et al.* 2005). The natural value of the Property is enhanced by its proximity to undeveloped mountain areas—the Property acts as an extension of open mountain areas. Although the Willow Canyon property is not large (10 acres) it is adjacent to US Forest Service land and other publicly owned open space areas and thus provides a larger, contiguous open space area. Without open space protection, the property would likely be developed with high-end residential properties. The relatively natural foothill habitat functions importantly as winter range for mule deer (*Odocoileus hemionus*) as well as providing riparian and other habitat for birds, small mammals, reptiles, and invertebrates.

Figure 9. Looking southwest across the property over the boundary between the Willow Canyon Property and the Hidden Valley Park. (11)

Ownership

Draper City will permit Sandy City to annex the Willow Canyon property into its city limits. Sandy City will own the Willow Canyon property.

Stewardship and Management

Salt Lake County will hold the conservation easement for the Willow Canyon, according to current plans, and will be responsible for stewardship, including monitoring the property and enforcing conditions of the easement to ensure that the Conservation Values are preserved. Sandy City will provide ongoing maintenance of the land in its current conditions with limited development or improvements, which will be in the form of trail extensions from Hidden Valley Park.

Adjacent Land

The Willow Canyon property is bounded to the north by Hidden Valley Park (Figure 10). To the west are private home lots. The Draper Irrigation Company owns the land south and east of the property.

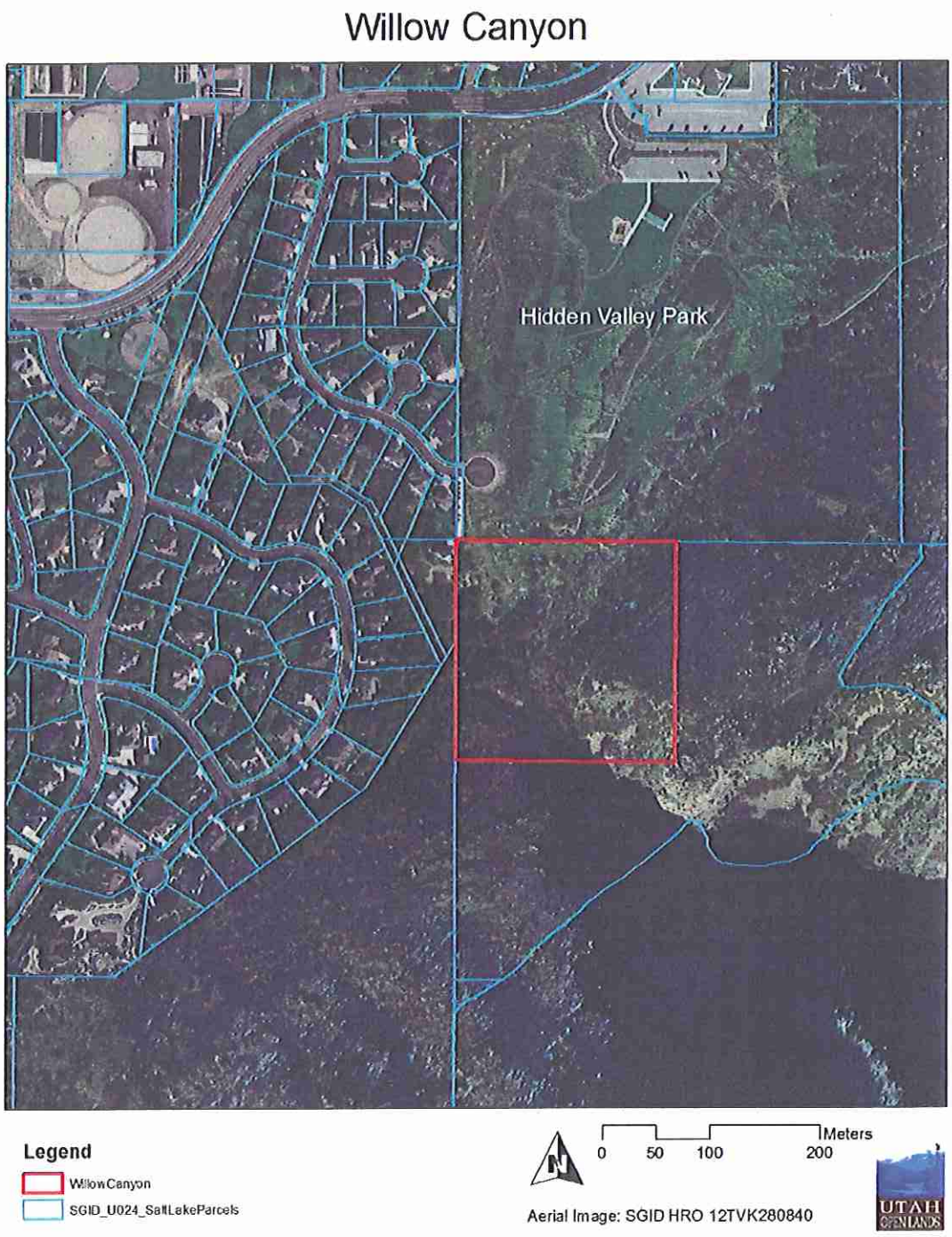

Figure 10. Parcel map of the area around the Willow Canyon Property.

Historical Context

A complete history of the Willow Canyon property was not located during this baseline documentation. Observations on the Willow Canyon property suggest that buildings have not recently existed on the property, if ever. Human use of the property is evident along the Bonneville Shoreline Trail, which has a well-packed dirt-surface that is maintained relatively free from obstructions. Other human uses on the Property can be seen in the form of a barb wire fence along its northern boundary, litter, and small barriers of plywood and other materials indicating the area has been used for paintball shooting games. Similar undeveloped land along the Wasatch Front has been used for recreational activities such as off-road vehicle use and camping, as well as informal dumping, so it is probable that some of this also occurred on this Property in the past. It is also probable that the land was used for grazing sometime in the past two centuries, but grazing does not currently occur on the property, nor has it within the last ten years.

Little Willow Creek was clear in July 2008, but silty with runoff in May, 2008; runoff sedimentation reflected to some degree the crossing of the Bonneville Shoreline Trail just south of the Property (there is no bridge—cyclists and walkers must pass over the creek on stepping stones or go through the creek). The banks of the creek have been bared in some places near the crossing of the Bonneville Shoreline Trail, apparently as people have rested and explored in the cool riparian area along the Creek. A diversion dam was observed on the Property on Little Willow Creek during baseline observation visits, but it was closed during these observations, and its current use is unknown.

Threats to Conservation Values

Inappropriate recreational uses: Some forms of recreational use tend to diminish conservation values of the Property. For example, informal trails degrade natural and scenic beauty and increase erosion of steep hillsides on the Property. The Bonneville Shoreline Trail crossing of Little Willow Creek may be detrimental to the stream quality and may require attention (Figure 11). Use by humans and pets poses threats to wildlife and plants in the natural area. Trails should be well-designed to prevent damage to the natural areas, especially the riparian area. Proper trail maintenance and signage will be required. Where human and dog use is focused at the intersection of Little Willow Creek and the Bonneville Shoreline Trail, changes will be appropriate to prevent further degradation of the stream banks. Some outreach efforts will be appropriate to help people understand the creek and its riparian connections. Appropriate trail use will be critical, but some of the value of the Property also lies in its preservation of appealing spaces that can be enjoyed off-trail. Patterns and consequences of off-trail use will need to be monitored and appropriate outreach and accountability strategies instituted as necessary to preserve the conservation values.

Maintenance: While maintenance of the Property is necessary to keep it clean, attractive, and safe, some maintenance decisions could also degrade conservation values of the Property. For example, unnecessarily severe restrictions related to trail use may decrease

public benefit from the open space. Conversely, inappropriately relaxed monitoring and enforcement of necessary restrictions may result in unsafe and unsightly conditions.

Invasive Species: Invasive plants and animals pose threats to the ecological integrity of the natural area. Efforts would do well to encourage a diversity of healthy native plant and animal species.

Pest control: Some plants and animals on the Property may be undesirable; however, the designation of an organism as a pest and attempts to control these pests may introduce the potential for harm to the conservation values of the Property. Some organisms may simply be perceived as pests, while actually presenting little or no threat and great benefits (e.g., bats). Many wild animals have the potential to present problems for humans (e.g., rattlesnakes, coyotes, deer, mountain lions, wasps, mosquitoes), but solving these problems does not always require complete local eradication of the wild animals. Outreach may be important to create a cultural climate that accepts or appropriately manages interactions with wild animals. Chemicals used to control nuisance plants and animals on the Property have the potential to do collateral damage; therefore, physical and mechanical control options are encouraged whenever possible. Before control is attempted, consequences to the conservation values should be carefully considered. Biological control of invasive plants or animals (i.e., by introduction of another organism) is discouraged because of the potential for unforeseen but significantly negative biological interactions. In some cases the use of chemical herbicides will probably be required to control invasive plants.

Pets: Off-leash dogs may pose threats to the conservation values of the Property, particularly if dogs are allowed to roam off the trails and or are aggressive toward wild animals or people. The Bonneville Shoreline Trail is not patrolled and dogs are not required to be on-leash at all times on the trail. Community and governmental support to control dogs on the Property will be important to prevent them from disturbing or harming recreational users and or wildlife either in the park or on the foothills and mountain slopes above the property. Dog fecal waste is not desirable on the Property. Feral and loose domestic cats present predation threats to wild animals including small mammals and birds. Some birds native to the Property such as spotted towhees (*Pipilo maculatus*) are ground-nesters and are therefore particularly vulnerable to cats. Feral cat feeding or sheltering should not occur on the Property.

Fire: The Willow Canyon Property is in the urban-wildland interface. Fire is important to ecological health when it cleans out accumulated fuels and trees and stimulates the growth of fire-dependent species. Historically, fires were probably important for maintaining healthy ecosystems in the area that is now Willow Canyon. However, uncontrolled fire on the Property would now threaten the safety of buildings and people.

Climate Change: Large-scale climate change will affect the environment local to the Property. If predicted increases of a few degrees F occur, native organisms on the Property will respond both to higher temperatures and side effects such as increased drought or invasion by other plants and animals. Therefore, predicted, continuing climate

change is another reason why stewardship of the Property would do well to emphasize conservation of water resources including riparian habitat and encourage a variety of native species.

Hazardous and Toxic Materials

No known hazardous or toxic materials are reported to be located on the Property, nor were signs detected that indicated hazardous or toxic material (e.g., dead animals, fluid discharge, inexplicable soil disturbance, or waste containers).

Utah GIS data do not show any leaking underground or aboveground storage tanks or sites of environmental concern at or on the Property (SGID_U100_UST_Tanks, SGID_U100_StateCERCLIS, SGID_U100_NationalPriorityList, SGID_U100_LUST_Tanks, SGID_U100_LUST_OpenTanks). Underground storage tanks are listed for the Southeast Regional Water Treatment Plant approximately 1000 feet west of Hidden Valley Park, but no hazard is known and these tanks are down-gradient from the Property.

No oil or gas pipelines or electrical power lines are known to cross the Property (no signs observed during baseline observations; SGID_U024_OilGasPiplines, SGID_U024_GasPiplines, SGID_U024_ElectricalLines).

Figure 11. Looking southwest at the place where the Bonneville Shoreline Trail crosses Little Willow Creek. (22)

ECOLOGY

Ecoregion

The Willow Canyon Property is part of the Central Basin and Range ecoregion, and has been classified specifically as part of the Moist Wasatch Front Footslopes (Woods *et al.* 2001). The Moist Wasatch Front Footslopes ecoregion is marked by streams flowing from the Wasatch Mountains. Currently this ecoregion has high population densities with areas of urban development interspersed with orchards and other agricultural lands (Woods *et al.* 2001).

The Property occurs in what Stokes (1986) classified as the Wasatch Front Valleys physiographic section of the Basin and Range physiographic province.

Climate

Temperatures in Salt Lake Valley where the Property occurs usually range from about 20 degrees F to about 90 degrees F, with record lows less than -20 degrees F and record highs greater than 105 degrees F. Average annual precipitation is about 16 inches with about 40 to 50 inches of snow each winter, and an average snow depth of up to about 12 inches during the winter months[3].

The Willow Canyon Property is in the United States Department of Agriculture (USDA) Hardiness Zone 6b or 7a, characterized by an average annual minimum temperature of -5 to 5 degrees F.[4] The annual frost-free period in the Salt Lake Valley usually lasts about 150 days[5], with an estimated 60-90 days above 86 degrees F (Heat Zone 7).[6]

Broad climate descriptions for the Property generalize small-scale environmental differences that correspond with very specific conditions. Small-scale environmental variability occurs on the Property due to abiotic variables (elevation, slope aspect, water, slope steepness, ground material, position relative to other physical features, etc.), and to biotic variables (plant species, plant height, plant density, animal use, etc.). Some small-scale environmental variability can be generally recognized. For example, as in other semiarid valley systems, south-facing slopes are the hottest and driest; snow drifts into low-lying areas; and densely vegetated areas provide thermal shelter. Riparian areas- which are the interfaces between land and water- are typically cooler and moister in the summer than upland areas. These and other small-scale climate variations contribute to desirable biological diversity in part by contributing to habitat complexity and biodiversity within the larger physiography.

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[3] http://www.slcgov.com/info/area_info/climate.htm
[4] US Natl. Arboretum Hardiness Zone Map 1990. http://www.usna.usda.gov/Hardzone/hzm-sw1.html
[5] http://www.slcgov.com/info/area_info/climate.htm
[6] American Horticultural Society Heat Zone Map 1997. http://www.ahs.org/publications/heat_zone_map.htm

Geology

Stokes (1987) wrote:

> "In a very real sense the Wasatch Range [of which the Property is part] has no western foothills; the front of the range rises abruptly from the valley floor. Even the short spurs that characterize the mountain front have been cut off or truncated. The steep west-facing front follows the Wasatch Fault zone that is clearly responsible for cutting away large slices of the range. The upward-moving block of the Wasatch Fault is the Wasatch Range, so spectacular that it has drawn attention from the down-dropped block, no less remarkable in its own way. The down-dropped block or blocks west of the Wasatch Fault zone are buried under thousands of feet of lake-bed sediments and alluvium worn from the adjacent mountains."

Although geologic processes have resulted in a quick transition from the valley to the mountain sides, the flanks of the mountains still represent foothill ecotones, where winter conditions are less severe than in the mountains, but where the mountains are still readily accessible.

The Property was covered by the ancient Lake Bonneville; the shoreline of this ancient lake is visible as a shelf or bench on the hillsides of the Wasatch Front and can be seen on the Property.

It is considered unlikely that any mineable mineral or petroleum resources exist on the Property; this is supported by the lack of any indication of mineable mineral resources on the Property on Utah GIS layers (SGID_U250_PotashDeposits1988, SGID_U250_PhosphateDeposits1988, SGID_U250_OilGasDeposits1988, SGID_U250_MineralDeposits1988, SGID_U250_CoalDepositAreas1988). Metal (e.g., copper, molybdenum, and lead) deposits are indicated in nearby mountains both by historical mining and by Utah GIS data (SGID_U250_MineralDeposits1988).

Soils

Soils on the western portion of the Property are classified by the Cooperative Soil Survey as "Preston sand, 1 to 10 percent slopes" and "stony land"; the steeper eastern portions are classified as "Gappmayer-Wallsburg association, very steep" (NRCS 2008). A soil map and detailed soil survey information can be found in the NRCS (2008) Custom Soil Resource Report for the Property.

<u>Information from the NRCS (2008) report includes:</u>

- Soils of steep slopes on the Property are classified as mountain gravelly loam, and typically support Gambel oak and or shrubs and plants such as slender wheatgrass (*Elymus trachycaulus*), snowberry (*Symphoricarpos oreophilus*), serviceberry

(*Amelanchier utahensis*), bitterbrush (*Purshia tridentata*), big sagebrush (*Artemisia tridentata*), bluebunch wheatgrass (*Pseudoroegneria spicata*), western wheatgrass (*Pascopyrum smithii*), and thickleaf peavine (*Lathyrus lanszwertii*).

- Soils of the relatively flat portions of the Property are of lacustrine origin and are classified as upland loam, which typically supports big sagebrush, and associated plants such as Indian ricegrass (*Achnatherum hymenoides)*, bluebunch wheatgrass (*Pseudoroegneria spicata*), and other shrubs, forbs, and grasses.
- The capacity of soils on the property to transmit water (i.e., for water to pass through them) is high to very high. No hydric soils are considered to exist on the Property.
- No soils on the property are listed as Prime Farmland Soils.
- The potential for soils on the eastern portions of the property (Gappmayer-Wallsburg association) to be damaged by fire is considered low to moderate. The potential for soils in the western portion of the property (Preston sand) is considered to be high.
- The land capability classification of soils on the Property indicates strong limitations for plant growth, indicating the need for careful consideration of appropriately adapted plants for ecological restoration plantings.
- Soils of the Property are rated as fair to poor as a potential source of sand or gravel.

Watershed

The Willow Canyon Property occurs in the Jordan River Watershed.

Water

Surface water

Little Willow Creek is the only permanent surface water on the Property.

Table 2. Physical characteristics of Little Willow Creek*

Bankfull Channel Width	3-5 ft
Bankfull Channel Depth	<1.5 ft
Substrate	Boulders and cobbles; sand and sediment in some places; much of the substrate appears to be granitic
Gradient**	0.3
Sinuosity***	1.04
Entrenchment	Low
Channel Form	Mostly high-gradient riffles
Flow Obstructions	Mostly rock
Woody Debris	Moderate amounts, mostly < 10 cm diam.
Lateral Overland Flows	Low due to steepness of valley
Aquatic Organisms	Mayfly larvae observed May 20, 2008; no fish detected

Notes

** Unless otherwise noted, information reported here is based on several observations along Little Willow Creek on the Property, but these observations were not part of a systematic study.*

*** Gradient was calculated from elevation change estimated from topographic lines in Figure 3 and stream length measurement using ArcMap with a 2006 HRO (12TVK280840.jpg).*

**** Sinuosity was calculated as stream length divided by straight line distance between the two points where the stream crosses the Property boundaries, measured in ArcMap with a 2006 HRO (12TVK280840.jpg).*

Ground water

Utah GIS data suggests groundwater at the Property occurs more than 30 ft below the surface (SGID_U500_ShallowGroundWater). However, no direct measurements of groundwater depths or conditions were accomplished during baseline documentation.

Figure 12. Steep hillside showing colluvium, sparser vegetation uphill (east) and high stony ground. Dominant vegetation is Gambel oak, curlleaf mountain mahogany, and big sagebrush. (25)

Vegetation

Plant communities

Plant communities on the Property are marked primarily by Gambel oak and bigtooth maple (Figure 13), with various other shrubs such as serviceberry, chokecherry, and currant (*Ribes* spp.). Riparian overstory vegetation species composition appears to be very similar to the overstory species composition of adjacent uplands at the same elevation, but riparian shrubs and trees are more dense and tall. A single, fairly large narrowleaf cottonwood (*Populus angustifolia*) was found beside Little Willow Creek on the Property. The riparian understory also contains primarily the same understory species as are found in the adjacent upland shrub communities at the same elevation. Poison ivy (*Toxicodendron rydbergii*) is abundant in some places.

The relatively flat, northwestern portion of the Property contains sparser shrub or tree vegetation with more grass compared to the rest of the Property. Grasses in the northwest portion of the Property are similar to grasses in Hidden Valley Park, which includes a

high proportion of cereal rye (*Secale cereale*). Invasive plants are present throughout the Property (Figure 14).

The steepest, rockiest portions of the hillsides in the Property support mountain mahogany, Gambel oak, and other shrubs, forbs, and grasses adapted to hot, dry conditions.

Spectral reflectance as analyzed by Southwestern Region GAP Analysis (SWreGAP) classifies most of the Property as "Rocky Mountain Gambel Oak-Mixed Montane Shrubland", with the northwestern portion of the Property classified as "Developed, Open Space - Low Intensity" (Figure 15). A portion of the riparian area was classified as "Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland" and the stony upland was classified as "Colorado Plateau Pinyon-Juniper Woodland"; these two classifications are probably erroneous due to similarities in reflectance between the actual landcover and the indicated SWreGAP classes. The riparian area probably is not delineated by SWreGAP because its plant community composition is similar to that of adjacent uplands (Gambel oak, bigtooth maple, and other shrubs).

Figure 13. Looking west at bigtooth maple and Gambel oak between the Bonneville Shoreline Trail and the relatively flat, lower portion of the Property. (18)

Figure 14. Looking south across the relatively flat area in the western portion of the Property. The soil here is classified as Preston Sand. Invasive, non-native dalmation toadflax is in the foreground, interspersed with nonnative cereal rye, and native big sagebrush, bunchgrasses, and other forbs. Notice plywood and debris barriers in the upper left corner of this photo; the barriers are used in paintball shooting games. Along the top of the picture is visible the dark green of the riparian vegetation- dominated by Gambel oak and bigtooth maple. (28)

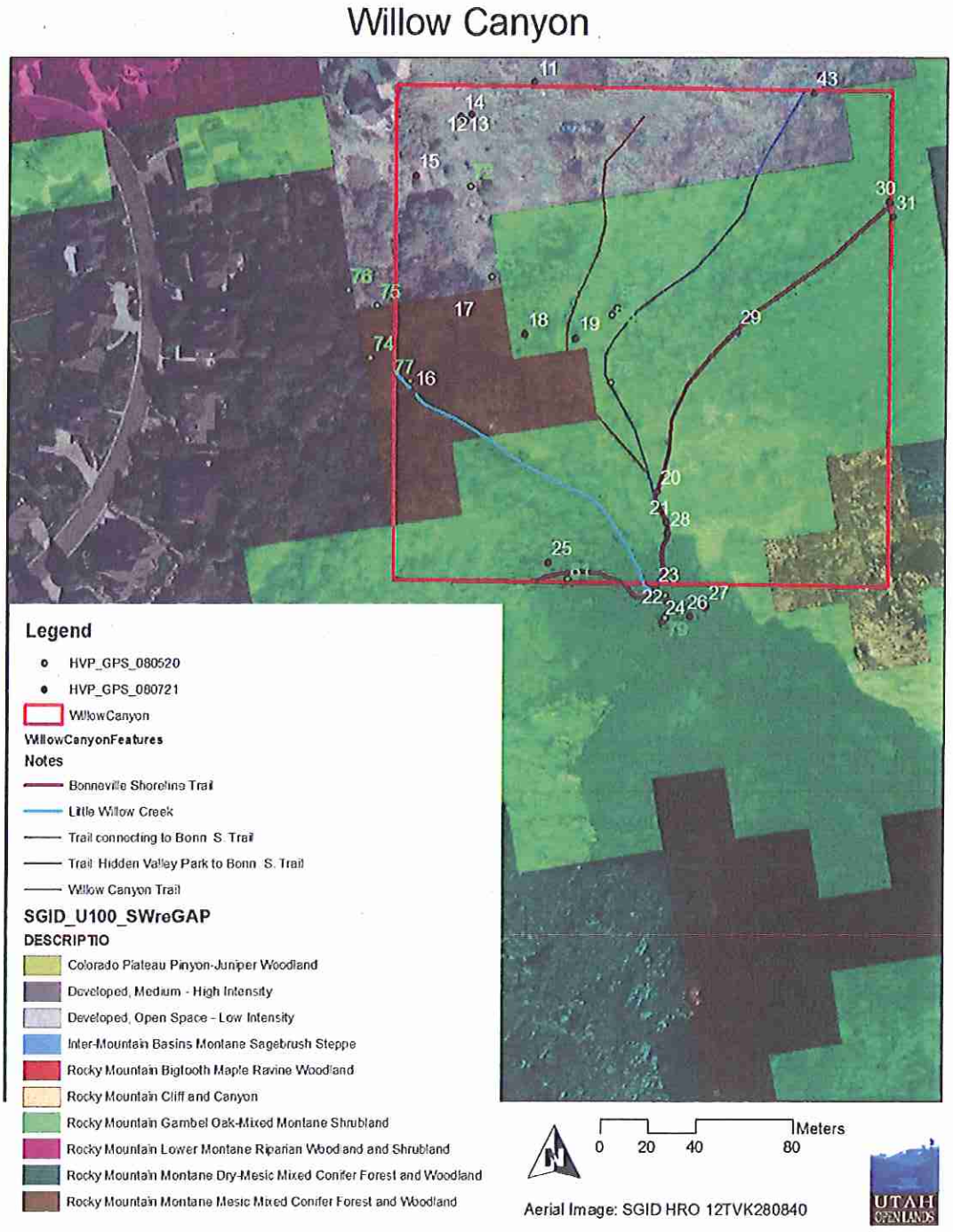

Figure 15. Landcover types classified by spectral reflectance, evaluated by SWreGAP.

Seral Stage

Plant communities on the lower (western) portions of the Property have been disturbed within recent years, which has resulted in mostly early successional conditions on land directly connected to the western portions of Hidden Valley Park. Shrubs and trees in the eastern portions of the Property appear to be mature and are probably mid to late successional (Figure 16).

Habitat Types of Special Concern for Conservation in Utah

Riparian habitat is listed as the highest priority habitat for conservation in Utah by the Utah Division of Wildlife Resources (Gorrell *et al.* 2005) and Utah Partners in Flight (Parrish *et al.* 2002).

All native foothill vegetation communities are valuable along the Wasatch Front because they are so strongly threatened by urban expansion. Much foothill habitat has already been lost along the Wasatch Front, and pressures of urban expansion continue to increase. The relatively flat portions of the Willow Canyon Property may be attractive targets for future development unless they are permanently protected as open space.

Plant species listed as special concern for conservation

No known threatened, endangered, or sensitive plant species were observed or reported on the Property.

Plant and Animal Species of Special Concern for Conservation

Attempts were made during baseline observations to identify unusual plant and animal species on the Property, including those that have federal or state listings as threatened, endangered, or in other ways that warrant special concern for conservation. Observations during baseline documentation visits were not definitive; more thorough surveys would be needed to determine the existence or define the status of species of special concern on the property.

Figure 16. Looking north along a trail through grass and curlleaf mountain mahogany. (19)

Wildlife

The relatively undeveloped conditions of the Willow Canyon Property help to ensure the presence of some wildlife. The relatively small size of the Property means that the wildlife value of the Property is importantly enhanced by proximity to undeveloped land of the Wasatch Mountains including adjacent land of the Hidden Valley Park, which acts both as additional habitat and as a buffer from urban development. Several animal species were observed, or their tracks, scat, or burrows were observed during baseline observations; however, baseline observations represent only a fraction of the actual species present.

It is foreseeable that continued urban development will effectively limit the number and types of organisms that desire to and can occur on the Property. Therefore, species that can effectively exist in close contact with human activity form the most likely future wildlife component of the property. Birds, butterflies, bats, mice, voles, pocket gophers, and adaptable predator species such as coyotes, raccoons, and weasels are likely to be found on the Property in the future. Mule deer will probably continue to use the Property for many years.

Mammals

The Property provides food, water, and shelter resources for mammals; mammals are in turn integral to the ecosystem. Small mammal herbivores and those that feed on seeds and fruits influence vegetation and disperse seeds. Some kinds of small mammals also feed on invertebrates such as crickets and grasshoppers. The burrows of small mammals provide shelter for other animals and are thought to aid in soil aeration and water infiltration. Small mammals form a base of prey species for predatory birds, reptiles, and mammals. Several species of mice and voles (e.g., *Peromyscus maniculatus, Microtus longicaudus*) probably occur on the property (burrows were observed during baseline observations). Pocket gophers (*Thomomys* spp.) also occur on the Property (burrows were observed near the Property). Evidence of red fox (*Vulpes vulpes*), coyotes (*Canis latrans*), and raccoons (*Procyon lotor*) were observed on or near the Property.

Larger mammals on the Property may influence vegetation structure and dynamics and soil structure. Abundant mule deer tracks and scat were observed on and near the Property and deer were observed on the Property in May, suggesting that mule deer use the Property for winter range and that some probably use the Property year-round. Large mammals require large areas of appropriate habitat; the Property will primarily be useful for many deer only as long the possibility exists for migration to and from the Property.

Mammals listed as special concern for conservation: No threatened, endangered, or sensitive (TES) mammals were detected on the Property during baseline observations, and none were reported on the Property. Utah Division of Wildlife Resources (UDWR) lists one sensitive mammal species documented in the US Geologic Survey quadrangle (quad) of the property (Appendix 2), for which habitat on the Property is appropriate: Townsend's big-eared bats (*Corynorhinus townsendii*) have been documented fairly recently (1998) in the Draper quad, and they have been documented also in quads

adjacent to the Property to the north, south, and east. It is therefore considered possible that Townsend's big-eared bats forage at some times on the Property, particularly where there are trees (Figure 17)[7].

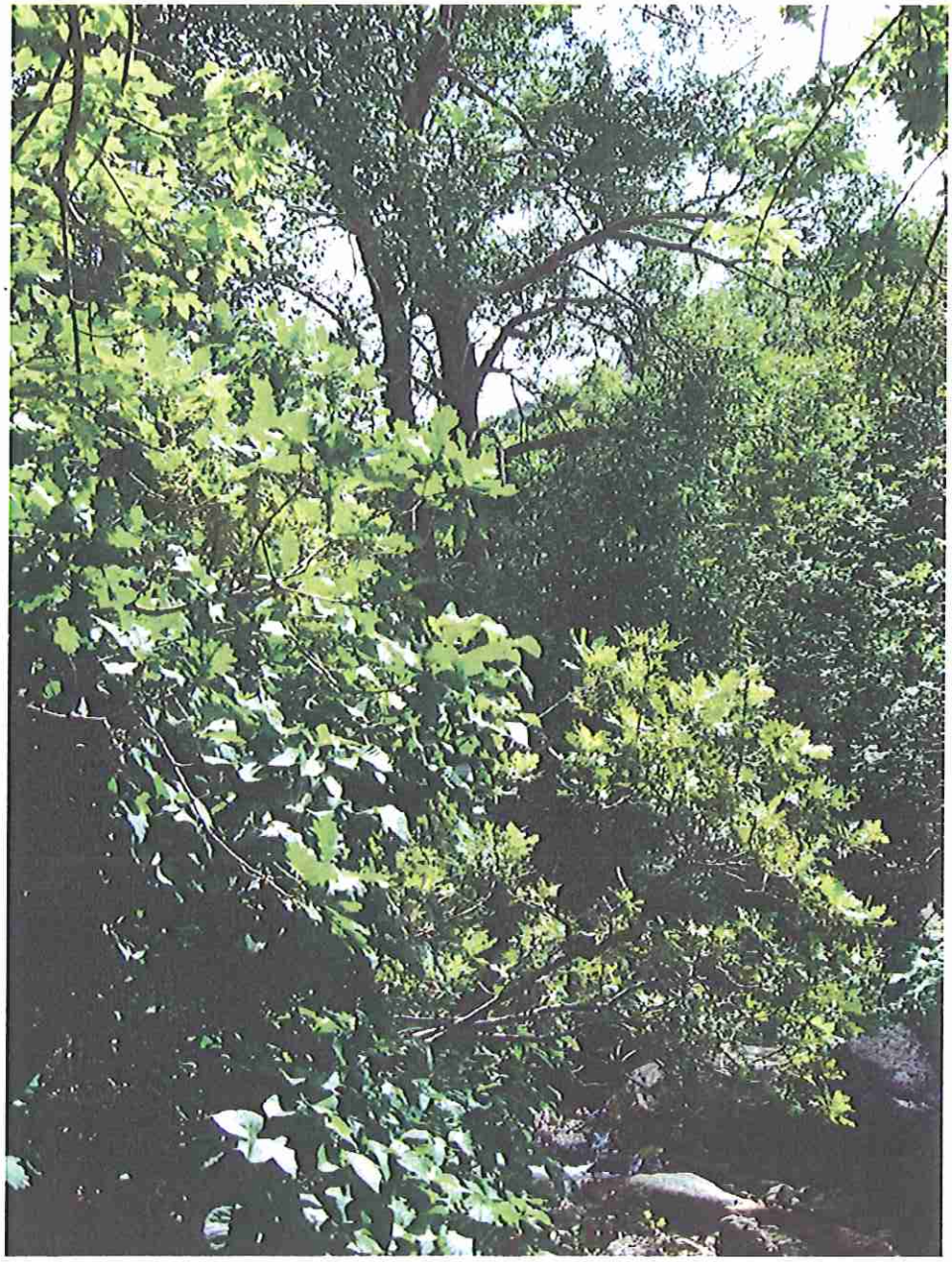

Figure 17. Looking east (upstream) through the riparian area at a narrowleaf cottonwood tree on the Property. Gambel oak and poison ivy are in the foreground. (16)

[7] http://dwrcdc.nr.utah.gov/rsgis2/Search/Display.asp?FlNm=corytown

Birds

The Willow Canyon Property includes habitat for birds with a variety of foraging, resting, and nesting requirements.

A turkey vulture (*Cathartes aura*), black-billed magpies (*Pica hudsonia*), American robins (*Turdus migratorius*), yellow warblers (*Dendroicha petechia*), black-headed grosbeaks (*Pheucticus melanocephalus*), and lazuli buntings (*Passerina amoena*) were detected on or near the Property during baseline observations.

Birds listed as special concern for conservation: Bird species of priority for conservation have been documented in the area of the Property (Appendix 2), but habitat on the Property is probably most appropriate only for Lewis's woodpeckers (*Melanerpes lewis*; documented in 1937 or 1938 in the adjacent quads to the north and south of the Property-Lehi and Sugarhouse quads).

Reptiles and Amphibians

Habitat is fair on the Property for reptiles and amphibians adapted to semi-arid, Wasatch Front ecosystems. Reptiles and amphibians on the Property prey on invertebrates and small vertebrates and form part of the prey-base for other predators. A few small lizards (genus *Sceloperus*) were observed during baseline observations. It is considered likely that garter snakes (*Thamnophis* spp.), gopher snakes (*Pituophis catenifer*), rubber boas (*Charina bottae*), great basin rattlesnakes (*Crotalus oreganus lutosus*), and possibly tiger salamanders (*Ambystoma tigrinum)* also occur on the Property.

Reptiles and amphibians listed as special concern for conservation: Western toads (*Bufo boreas*) have been documented in the area of the Property (Draper quad, 1962; and most other quads adjacent to the Draper quad), and may occur at some time(s) on the Property (Appendix 2). Habitat is also appropriate for smooth greensnakes (*Opheodrys vernalis*), which have been documented in the adjacent quad to the north (Sugarhouse, 1960).

Fish

No fish were detected on the Property or in Little Willow Creek near the Property.

Invertebrates

Invertebrates are important ecological elements on the Property as they support other wildlife species, interact with vegetation, link vegetation and wildlife, function in decomposition, and connect other ecological elements in nutrient cycles and energy transfers. Invertebrates observed on the Property include grasshoppers, crickets, flies, bees, wasps, butterflies, moths, beetles, ants, dragonflies, and spiders. Natural habitat complexity (viewed by some as messiness) helps to provide invertebrates with the living spaces they need (Figure 18).

Invertebrates listed as special concern for conservation: No invertebrate species of concern for conservation in Utah are known to occur on or near the Property; however, habitat may be appropriate for lyrate mountainsnails (*Oreohelix haydeni*), which may

have been observed in quads adjacent to the Property to the east (Dromedary peak; pre-1929, questionable) and the northeast (Mount Aire; pre-1929, questionable).

Figure 18. Looking west down Little Willow Creek from the Bonneville Shoreline Trail Crossing. This shows the largest accumulation of down wood observed in the stream on or near the Property. (23)

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APPENDIX 1. PHOTOPOINT COORDINATES

Points were established and photographs collected from the Property and nearby areas, including the mouth of Willow Canyon. Points were established with a Garmin GPSMAP 60CSX. The coordinate system is WGS 1984. Data points and corresponding photographs are on file with Salt Lake County Open Space Program.

WPT	Latitude	Longitude	Alt	Date	Time
1	40.537990	-111.812502	1492.3	21-Jul-08	12:55:26PM
2	40.539771	-111.812720	1414.7	21-Jul-08	12:57:15PM
3	40.539927	-111.812379	1422.4	21-Jul-08	12:58:45PM
4	40.539780	-111.812183	1427.4	21-Jul-08	12:59:35PM
5	40.538829	-111.811832	1445.2	21-Jul-08	1:01:29PM
6	40.538770	-111.811952	1449.1	21-Jul-08	1:02:19PM
7	40.537640	-111.813282	1452.4	21-Jul-08	1:05:02PM
8	40.537309	-111.813628	1456	21-Jul-08	1:06:27PM
9	40.537250	-111.813818	1458	21-Jul-08	1:07:10PM
10	40.537168	-111.814322	1455.6	21-Jul-08	1:08:01PM
11	40.536969	-111.814610	1460.8	21-Jul-08	1:09:38PM
12	40.536845	-111.814914	1464.7	21-Jul-08	1:10:45PM
13	40.536822	-111.814944	1466.1	21-Jul-08	1:11:10PM
14	40.536838	-111.814969	1470.7	21-Jul-08	1:12:40PM
15	40.536620	-111.815183	1472.9	21-Jul-08	1:13:41PM
16	40.535818	-111.815183	1492.6	21-Jul-08	1:17:48PM
17	40.536075	-111.815004	1492.1	21-Jul-08	1:18:57PM
18	40.536039	-111.814643	1513.5	21-Jul-08	1:21:09PM
19	40.536024	-111.814395	1521.9	21-Jul-08	1:22:42PM
20	40.535463	-111.813985	1538	21-Jul-08	1:25:01PM
21	40.535351	-111.813943	1541.3	21-Jul-08	1:26:09PM
22	40.535059	-111.813931	1542.3	21-Jul-08	1:27:57PM
23	40.535105	-111.813991	1541.6	21-Jul-08	1:28:30PM
24	40.534986	-111.813953	1550.2	21-Jul-08	1:29:45PM
25	40.535197	-111.814513	1553.1	21-Jul-08	1:31:25PM
26	40.535006	-111.813819	1557	21-Jul-08	1:34:23PM
27	40.535041	-111.813742	1560.3	21-Jul-08	1:34:51PM
28	40.535309	-111.813935	1560.3	21-Jul-08	1:36:19PM
29	40.536055	-111.813605	1569.2	21-Jul-08	1:37:48PM
30	40.536540	-111.812880	1573.8	21-Jul-08	1:40:17PM
31	40.536486	-111.812861	1575	21-Jul-08	1:40:27PM
32	40.538617	-111.810430	1583.2	21-Jul-08	1:43:57PM
33	40.538497	-111.810562	1585.6	21-Jul-08	1:44:54PM
34	40.539014	-111.810013	1587.5	21-Jul-08	1:46:19PM
35	40.539538	-111.809712	1582.2	21-Jul-08	1:47:53PM

36	40.539569	-111.809685	1584.6	21-Jul-08	1:48:43PM
37	40.539252	-111.810522	1576	21-Jul-08	1:49:43PM
38	40.538799	-111.811915	1551.9	21-Jul-08	1:51:50PM
39	40.538390	-111.812094	1554.1	21-Jul-08	1:53:55PM
40	40.537673	-111.812497	1562	21-Jul-08	1:55:14PM
41	40.537444	-111.812799	1563.7	21-Jul-08	1:56:26PM
42	40.537000	-111.813221	1565.6	21-Jul-08	1:58:03PM
43	40.536938	-111.813252	1569	21-Jul-08	1:58:57PM
44	40.537243	-111.813105	1565.4	21-Jul-08	1:59:57PM
45	40.537819	-111.813335	1551.9	21-Jul-08	2:01:26PM
46	40.538164	-111.813474	1554.1	21-Jul-08	2:02:46PM
47	40.538658	-111.813326	1555.5	21-Jul-08	2:05:15PM
65	40.538806	-111.814056	1560	28-May-08	
66	40.538833	-111.814056	1559	28-May-08	
67	40.538833	-111.814056	1559	28-May-08	
68	40.538528	-111.814417	1556	28-May-08	
69	40.537444	-111.814278	1555	28-May-08	
70	40.537361	-111.814028	1560	28-May-08	
71	40.537194	-111.813944	1562	28-May-08	
72	40.536583	-111.814917	1558	28-May-08	
73	40.536250	-111.814806	1559	28-May-08	
74	40.535944	-111.815389	1562	28-May-08	
75	40.536139	-111.815361	1559	28-May-08	
76	40.536194	-111.815500	1553	28-May-08	
77	40.535861	-111.815194	1568	28-May-08	
78	40.535861	-111.814222	1590	28-May-08	
79	40.535000	-111.813944	1596	28-May-08	
80	40.535083	-111.813944	1595	28-May-08	
81	40.535139	-111.814417	1584	28-May-08	
82	40.536139	-111.814194	1581	28-May-08	
83	40.536111	-111.814222	1570	28-May-08	

APPENDIX 2: COMPLETE LIST OF THREATENED, ENDANGERED, AND SENSITIVE WILDLIFE SPECIES DOCUMENTED NEAR THE WILLOW CANYON PROPERTY.

Species documentation and codes obtained from the UDWR Utah Conservation Data Center, http://atlas.utah.gov/wildlife/viewer.htm. accessed July 2008.

Rec	USGS Quad Map	Scientific Name	Common Name	Identified?	Date Observed	State Status	Federal Status	Quad Location
1	DRAPER	*Haliaeetus leucocephalus*	Bald Eagle	Y - Yes	4/1/1928	S-ESA	LT	site
2	DRAPER	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1981	CS		
3	DRAPER	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1998	CS		
4	DRAPER	*Corynorhinus townsendii*	Townsend's Big-eared Bat	Y - Yes	5/18/1951	SPC		
5	DRAPER	*Centrocercus urophasianus*	Greater Sage-grouse	Y - Yes	7/4/1932	SPC		
6	DRAPER	*Coccyzus americanus*	Yellow-billed Cuckoo	Y - Yes	1942-PRE	S-ESA	C	
7	DRAPER	*Asio flammeus*	Short-eared Owl	Y - Yes	6/24/1999	SPC		
8	DRAPER	*Corynorhinus townsendii*	Townsend's Big-eared Bat	Y - Yes	1998	SPC		
9	DRAPER	*Iotichthys phlegethontis*	Least Chub	Y - Yes	1953	CS		
10	DRAPER	*Margaritifera falcata*	Western Pearlshell	Y - Yes	1929-PRE	SPC		
11	DRAPER	*Athene cunicularia*	Burrowing Owl	? - Questionable	8/5/1987	SPC		
12	DRAPER	*Bufo boreas*	Western Toad	Y - Yes	7/4/1962	SPC		
1	LEHI	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1981	CS		south
2	LEHI	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1998	CS		
3	LEHI	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1999-PRE	CS		
4	LEHI	*Melanerpes lewis*	Lewis's Woodpecker	Y - Yes	6/4/1937	SPC		
5	LEHI	*Accipiter gentilis*	Northern Goshawk	Y - Yes	7/29/2004	CS		
6	LEHI	*Centrocercus urophasianus*	Greater Sage-grouse	Y - Yes	7/4/1932	SPC		
7	LEHI	*Numenius americanus*	Long-billed Curlew	Y - Yes	6/11/2004	SPC		
8	LEHI	*Coccyzus americanus*	Yellow-billed Cuckoo	Y - Yes	1942-PRE	S-ESA	C	

Rec	USGS Quad Map	Scientific Name	Common Name	Identified?	Date Observed	State Status	Federal Status	Quad Location
9	LEHI	*Athene cunicularia*	Burrowing Owl	Y - Yes	1979-SUM	SPC		
10	LEHI	*Asio flammeus*	Short-eared Owl	Y - Yes	4/7/1942	SPC		
11	LEHI	*Dolichonyx oryzivorus*	Bobolink	Y - Yes	5/27/2003	SPC		
12	LEHI	*Corynorhinus townsendii*	Townsend's Big-eared Bat	Y - Yes	1998	SPC		
13	LEHI	*Vulpes macrotis*	Kit Fox	Y - Yes	12/24/1968	SPC		
14	LEHI	*Vulpes macrotis*	Kit Fox	Y - Yes	1972-FA	SPC		
15	LEHI	*Haliaeetus leucocephalus*	Bald Eagle	Y - Yes	1/10/2003	S-ESA	LT	
16	LEHI	*Buteo regalis*	Ferruginous Hawk	Y - Yes	1932-04	SPC		
1	SUGAR HOUSE	*Haliaeetus leucocephalus*	Bald Eagle	Y - Yes	2/4/1988	S-ESA	LT	
2	SUGAR HOUSE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	8/26/1998	CS		
3	SUGAR HOUSE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	6/2/1998	CS		
4	SUGAR HOUSE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	5/22/1998	CS		
5	SUGAR HOUSE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1998	CS		
6	SUGAR HOUSE	*Corynorhinus townsendii*	Townsend's Big-eared Bat	Y - Yes	5/18/1951	SPC		
7	SUGAR HOUSE	*Accipiter gentilis*	Northern Goshawk	Y - Yes	7/29/2004	CS		
8	SUGAR HOUSE	*Buteo regalis*	Ferruginous Hawk	Y - Yes	8/25/1988	SPC		
9	SUGAR HOUSE	*Numenius americanus*	Long-billed Curlew	Y - Yes	7/8/1992	SPC		north
10	SUGAR HOUSE	*Coccyzus americanus*	Yellow-billed Cuckoo	Y - Yes	7/9/1992	S-ESA	C	
11	SUGAR HOUSE	*Asio flammeus*	Short-eared Owl	Y - Yes	6/24/1999	SPC		
12	SUGAR HOUSE	*Rana luteiventris*	Columbia Spotted Frog	Y - Yes	1960	CS		
13	SUGAR HOUSE	*Opheodrys vernalis*	Smooth Greensnake	Y - Yes	5/14/1960	SPC		
14	SUGAR HOUSE	*Iotichthys phlegethontis*	Least Chub	Y - Yes	1953	CS		
15	SUGAR HOUSE	*Margaritifera falcata*	Western Pearlshell	Y - Yes	1884-PRE	SPC		
16	SUGAR HOUSE	*Margaritifera falcata*	Western Pearlshell	Y - Yes	1929-PRE	SPC		
17	SUGAR HOUSE	*Margaritifera falcata*	Western Pearlshell	Y - Yes	7/4/1927	SPC		

Rec	USGS Quad Map	Scientific Name	Common Name	Identified?	Date Observed	State Status	Federal Status	Quad Location
18	SUGAR HOUSE	*Melanerpes lewis*	Lewis's Woodpecker	Y - Yes	1938-12	SPC		
19	SUGAR HOUSE	*Bufo boreas*	Western Toad	Y - Yes	7/4/1962	SPC		
1	MOUNT AIRE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	5/19/1998	CS		
2	MOUNT AIRE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	6/2/1998	CS		
3	MOUNT AIRE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	5/22/1998	CS		
4	MOUNT AIRE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1981	CS		
5	MOUNT AIRE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1998	CS		
6	MOUNT AIRE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	? - Questionable	7/20/1998	CS		
7	MOUNT AIRE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1998	CS		
8	MOUNT AIRE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1998	CS		
9	MOUNT AIRE	*Accipiter gentilis*	Northern Goshawk	Y - Yes	7/29/2004	CS		northeast
10	MOUNT AIRE	*Buteo regalis*	Ferruginous Hawk	Y - Yes	8/25/1988	SPC		
11	MOUNT AIRE	*Margaritifera falcata*	Western Pearlshell	Y - Yes	1929-PRE	SPC		
12	MOUNT AIRE	*Oreohelix haydeni*	Lyrate Mountainsnail	? - Questionable	1929-PRE	SPC		
13	MOUNT AIRE	*Bufo boreas*	Western Toad	Y - Yes	1913	SPC		
14	MOUNT AIRE	*Bufo boreas*	Western Toad	Y - Yes	8/23/1981	SPC		
15	MOUNT AIRE	*Margaritifera falcata*	Western Pearlshell	Y - Yes	7/4/1927	SPC		
16	MOUNT AIRE	*Cypseloides niger*	Black Swift	Y - Yes	1991-08	SPC		
17	MOUNT AIRE	*Bufo boreas*	Western Toad	Y - Yes	7/4/1962	SPC		
1	DROMEDARY PEAK	*Haliaeetus leucocephalus*	Bald Eagle	Y - Yes	4/1/1928	S-ESA	LT	
2	DROMEDARY PEAK	*Haliaeetus leucocephalus*	Bald Eagle	Y - Yes	1928-PRE	S-ESA	LT	east
3	DROMEDARY PEAK	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1981	CS		
4	DROMEDARY PEAK	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1998	CS		

Rec	USGS Quad Map	Scientific Name	Common Name	Identified?	Date Observed	State Status	Federal Status	Quad Location
5	DROMEDARY PEAK	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1996	CS		
6	DROMEDARY PEAK	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	? - Questionable	1999	CS		
7	DROMEDARY PEAK	*Picoides tridactylus*	Three-toed Woodpecker	Y - Yes	5/13/1997	SPC		
8	DROMEDARY PEAK	*Accipiter gentilis*	Northern Goshawk	Y - Yes	7/29/2004	CS		
9	DROMEDARY PEAK	*Buteo regalis*	Ferruginous Hawk	Y - Yes	8/25/1988	SPC		
10	DROMEDARY PEAK	*Centrocercus urophasianus*	Greater Sage-grouse	Y - Yes	7/4/1932	SPC		
11	DROMEDARY PEAK	*Coccyzus americanus*	Yellow-billed Cuckoo	Y - Yes	1942-PRE	S-ESA	C	
12	DROMEDARY PEAK	*Corynorhinus townsendii*	Townsend's Big-eared Bat	Y - Yes	1998	SPC		
13	DROMEDARY PEAK	*Oreohelix haydeni*	Lyrate Mountainsnail	? - Questionable	1929-PRE	SPC		
14	DROMEDARY PEAK	*Bufo boreas*	Western Toad	Y - Yes	1985	SPC		
15	DROMEDARY PEAK	*Bufo boreas*	Western Toad	Y - Yes	8/23/1981	SPC		
16	DROMEDARY PEAK	*Bufo boreas*	Western Toad	Y - Yes	8/11/1985	SPC		
17	DROMEDARY PEAK	*Bufo boreas*	Western Toad	Y - Yes	6/29/1913	SPC		
18	DROMEDARY PEAK	*Bufo boreas*	Western Toad	Y - Yes	9/9/1998	SPC		
19	DROMEDARY PEAK	*Bufo boreas*	Western Toad	Y - Yes	7/4/1962	SPC		
1	TIMPANOGOS CAVE	*Haliaeetus leucocephalus*	Bald Eagle	Y - Yes	1928-PRE	S-ESA	LT	
2	TIMPANOGOS CAVE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1981	CS		
3	TIMPANOGOS CAVE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1998	CS		southeast
4	TIMPANOGOS CAVE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1999-PRE	CS		
5	TIMPANOGOS CAVE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	Y - Yes	1996	CS		

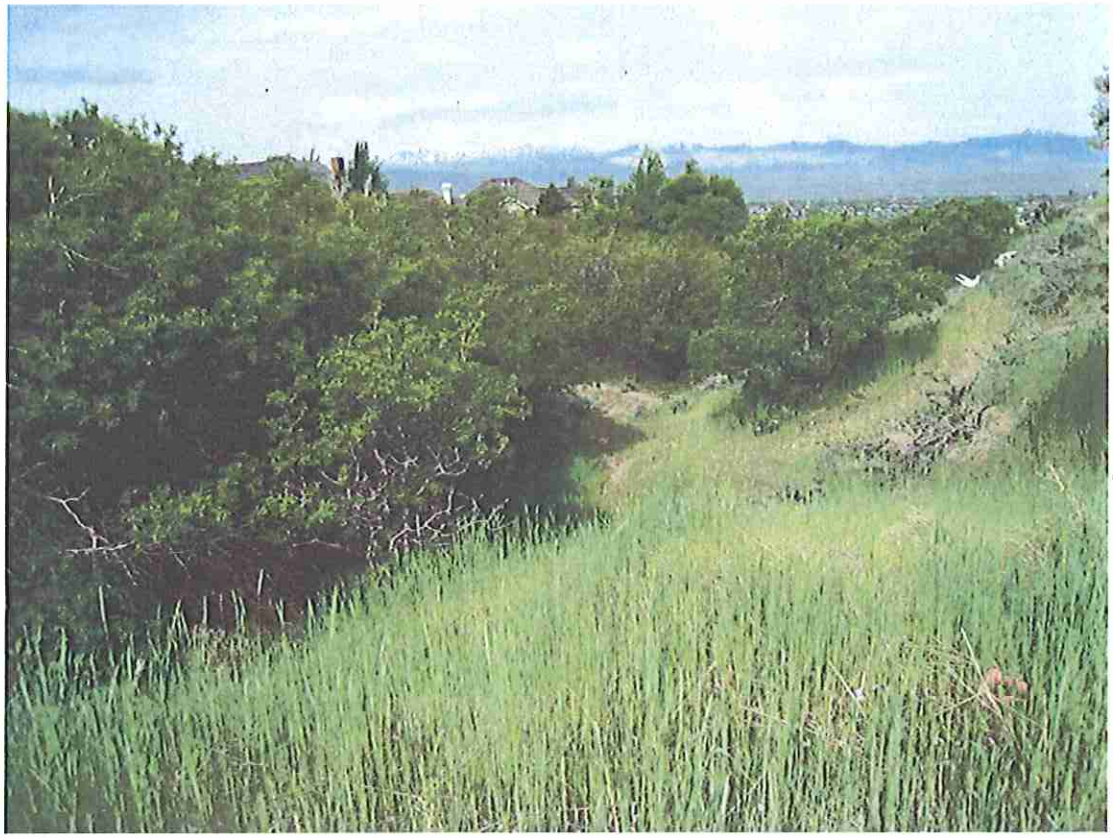
Rec	USGS Quad Map	Scientific Name	Common Name	Identified?	Date Observed	State Status	Federal Status	Quad Location
6	TIMPANOGOS CAVE	*Oncorhynchus clarki utah*	Bonneville Cutthroat Trout	? - Questionable	1999	CS		
7	TIMPANOGOS CAVE	*Accipiter gentilis*	Northern Goshawk	Y - Yes	7/29/2004	CS		
8	TIMPANOGOS CAVE	*Centrocercus urophasianus*	Greater Sage-grouse	Y - Yes	7/4/1932	SPC		
9	TIMPANOGOS CAVE	*Coccyzus americanus*	Yellow-billed Cuckoo	Y - Yes	1942-PRE	S-ESA	C	
10	TIMPANOGOS CAVE	*Asio flammeus*	Short-eared Owl	Y - Yes	4/7/1942	SPC		
11	TIMPANOGOS CAVE	*Dolichonyx oryzivorus*	Bobolink	Y - Yes	5/27/2003	SPC		
12	TIMPANOGOS CAVE	*Corynorhinus townsendii*	Townsend's Big-eared Bat	Y - Yes	1998	SPC		
13	TIMPANOGOS CAVE	*Vulpes macrotis*	Kit Fox	Y - Yes	1972-FA	SPC		
14	TIMPANOGOS CAVE	*Bufo boreas*	Western Toad	Y - Yes	6/30/1937	SPC		
15	TIMPANOGOS CAVE	*Cypseloides niger*	Black Swift	Y - Yes	8/22/1961	SPC		
16	TIMPANOGOS CAVE	*Myotis thysanodes*	Fringed Myotis	Y - Yes	8/24/1986	SPC		
17	TIMPANOGOS CAVE	*Bufo boreas*	Western Toad	Y - Yes	6/18/1937	SPC		

APPENDIX 3. ADDITIONAL PHOTOS

Waypoint 12. Looking south across the relatively flat portion of the Property. Plywood and debris barriers that have been used in paintball shooting games can be seen near the middle of the photo.

Waypoint 12. Looking northwest at gap in fence where vehicles have driven and at an old trailer. There is a lot of trash in and under the trailer. The trailer should be removed.

Waypoint 17. Trash by rock at the edge of the riparian area just south of the open flat area.

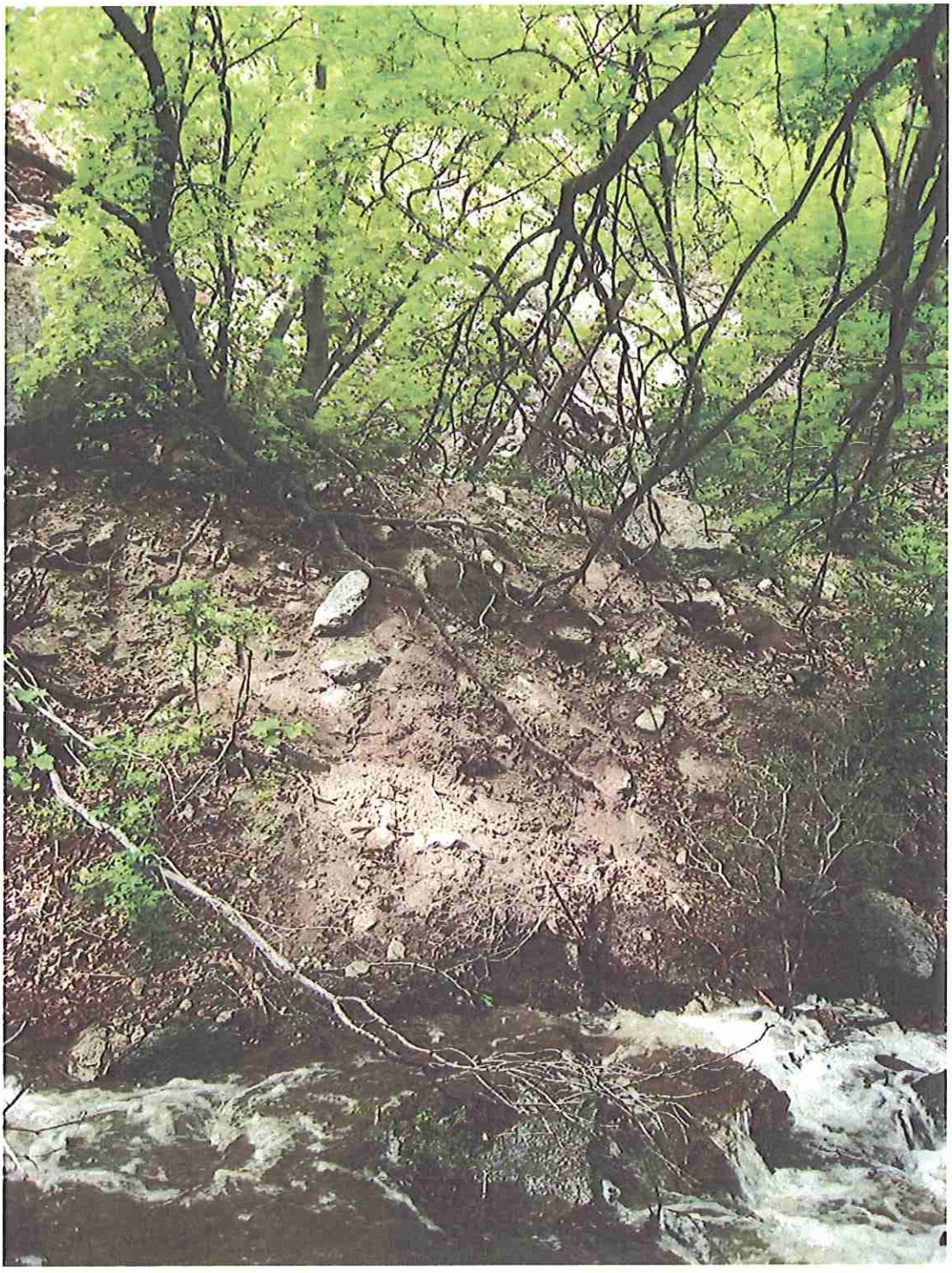


Waypoint 73. Gambel oak at the western property line looking west.

Waypoint 73. Southwestern property line looking south.

Waypoint 75. Looking north from Bonneville Shoreline Trail across the tops of the riparian forest.

Waypoint 78. Mountain mahogany, Gambel oak, and big sagebrush along the Bonneville Shoreline Trail looking generally northwest.



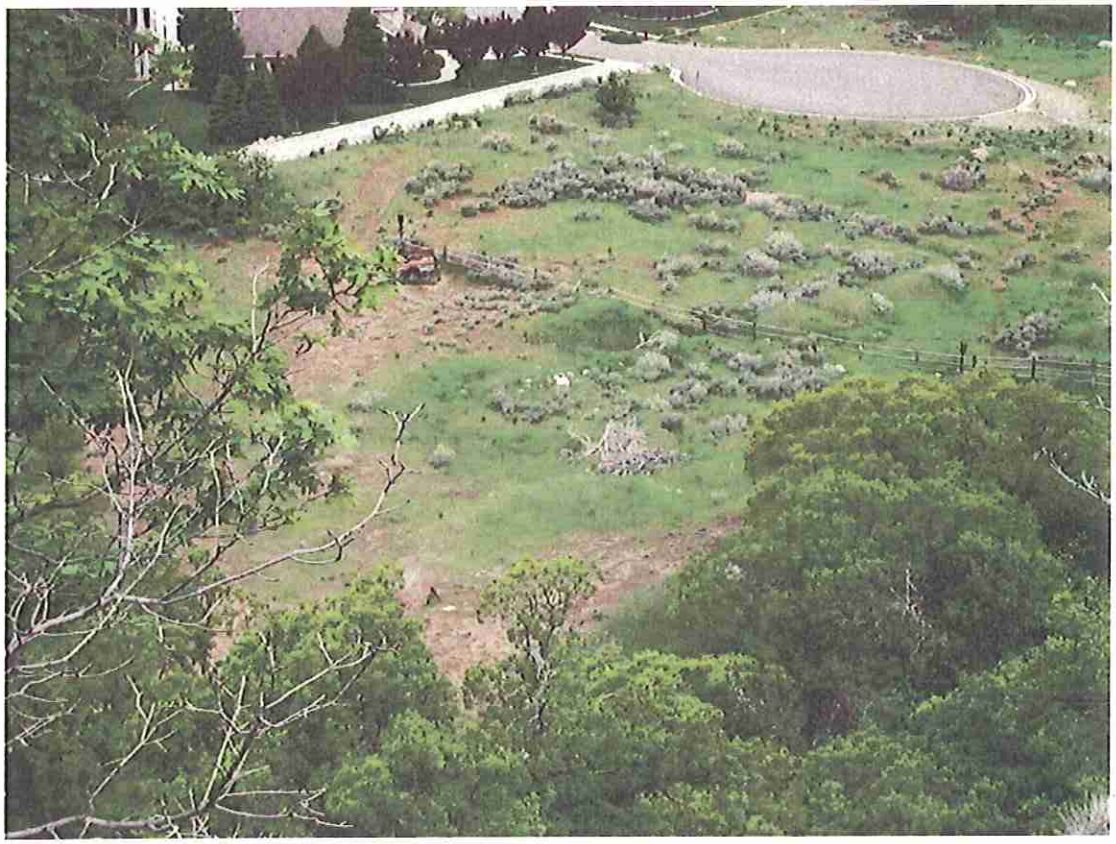
Waypoint 79. Looking south at streambank erosion below rocky outcrop at entrance to Little Willow Canyon.

Waypoint 79. Bonneville Shoreline Trail crossing Little Willow creek.

Waypoint 80. Lookig north. The jogger has just crossed Little Willow Creek on the Bonneville Shoreline Trail. Arthur Morris is standing in the Creek.

Waypoint 81, May, 2008. Looking northward from Bonneville Shoreline Trail over Willow Canyon and Hidden Valley Park properties.

Waypoint 72. Looking northwest at a home at the western edge of Willow Canyon property. A paintball barrier is in the foreground.



Waypoint 83. Looking down on the Willow Canyon property's northwestern corner. Cassowary Dr. extends into the Hidden Valley Park. The fence is the property line.

Current		Proposed	
BRASS Program #	BRASS Program Name	BRASS Program #	BRASS Program Name
3551DFLT	Org Default Program	3551DFLT	Org Default Program
		3551STDS	SPCC/STEC-Debt Service Program
		3551ZADS	ZAPII-Debt Service Program
		3551CGQL	Contributions-Governmental-Q.Life
		3551CGQG	Contributions-Governmental-Q.Gov
		3551CGEN	Contributions-Governmental-Envir
		3551CGEU	Contributions-Governmental-Education
		3551CGED	Contributions-Governmental-Economic Dev
		3551CGPS	Contributions-Governmental-Pub Safety
		3551CNQL	Contributions-Non-Governmental-Q.Life
		3551CNQG	Contributions-Non-Governmental-Q.Gov
		3551CNEN	Contributions-Non-Governmental-Envir
		3551CNEU	Contributions-Non-Governmental-Education
		3551CNED	Contributions-Non-Governmental-Economic Dev
		3551CNPS	Contributions-Non-Governmental-Public Safety
		3551ADMN	Administration
5000DFLT	Org Default Program	5000DFLT	Org Default Program
		5000TRIP	Trip Reduction Program
		5000CGQL	Contributions-Governmental-Q.Life
		5000CGQG	Contributions-Governmental-Q.Gov
		5000CGEN	Contributions-Governmental-Envir
		5000CGEU	Contributions-Governmental-Education
		5000CGED	Contributions-Governmental-Economic Dev
		5000CGPS	Contributions-Governmental-Pub Safety
		5000CNQL	Contributions-Non-Governmental-Q.Life
		5000CNQG	Contributions-Non-Governmental-Q.Gov
		5000CNEN	Contributions-Non-Governmental-Envir
		5000CNEU	Contributions-Non-Governmental-Education
		5000CNED	Contributions-Non-Governmental-Economic Dev
		5000CNPS	Contributions-Non-Governmental-Public Safety
		5000MEMB	Subscriptions & Memberships
		5000LGAB	Legal, Audit & Bond Fees
		5000CPQL	Cosultant & Professional Fees-Q.Life
		5000CPQG	Cosultant & Professional Fees-Q.Gov
		5000CPEN	Cosultant & Professional Fees-Envir
		5000CPEU	Cosultant & Professional Fees-Education
		5000CPED	Cosultant & Professional Fees-Economic Dev
		5000CPPS	Cosultant & Professional Fees-Public Safety
		5000ADMN	Administration
		5000INGB	Intergovenmental-Weed Control & Bee Inspections
		5000INGL	Intergovenmental-Land Cordinator and Others

Sandy City Copy

INTERLOCAL COOPERATION AGREEMENT

between

SALT LAKE COUNTY and SANDY CITY

This Interlocal Cooperation Agreement ("Agreement") is entered into this 5th day of August 2008, pursuant to the Utah Interlocal Cooperation Act, codified in Title 11, Chapter 13 of Utah Code Ann., as amended (the "Interlocal Act"). This Agreement is entered into by and between Sandy City, a municipal corporation of the State of Utah ("City"), and Salt Lake County, a body corporate and politic of the State of Utah ("County"). County and City are sometimes referred to as the "Parties."

WHEREAS, City owns certain real property known as the Hidden Valley Park ("Park") which park encompasses approximately 38 acres. Adjacent to the Park is approximately 10 acres of open land ("open space land") that the City desires to acquire for the purposes of preserving as open space land and to combine with the Park for use by the public. Further, as part of the acquisition, the County will acquire conservation easements encumbering the Park and open space land;

WHEREAS, the County issued general obligation bonds, in accordance with the Local Government Bonding Act, Title 11, Chapter 14, Utah Code, (the "Bond Act"), for the acquisition and preservation of open space and parks in Salt Lake County, either alone or jointly with another local political subdivision;

WHEREAS, City is a "local political subdivision" as defined in the Bond Act and has requested that the County use a portion of its general obligation bonds issued for the acquisition and preservation of open space and parks to finance the purchase of a conservation/preservation easement(s) to be owned by County;

WHEREAS, the 10 acres of open space land to be purchased by City possesses watershed, wildlife habitat, natural, scenic, recreational, educational, historical, geological, and open space values, of great importance to residents of the City and the County;

WHEREAS, the Park has significant recreational value to the residents of the City and the County;

WHEREAS, County and City have determined that it will be mutually beneficial and in the best interests of the residents of the County and City to enter into this Agreement to preserve the Park and open space land for the enjoyment of the public and all future generations; and

WHEREAS, the City and County have determined that the consideration agreed upon by the Parties is fair and equitable.

NOW THEREFORE, the County and City enter into the following agreement:

1. Project. The County and City agree to jointly cooperate in the development and enhancement of the 10 acre open space land, which property is generally described in Exhibit "A" attached hereto. The Parties further agree to jointly cooperate to preserve the open space land with a conservation easement to be owned by County. County and City further agree to jointly cooperate in the preservation of the Park which is generally described in Exhibit "A" attached hereto with the grant of a conservation easement to Salt Lake County also covering the Park.

2. Finance. The County agrees to pay to City the amount of $1,600,000 for the grant of a conservation easement (or easements) covering the open space land and the Park. Said conservation easement(s) will include the 38 acres and the 10 acres preserving both the open space land and the Park as open space for recreational and other appropriate uses. No County funds may be used to retire any debt incurred by City.

3. Ownership and Maintenance. The County and City agree that the County will own the Easements and City shall maintain the Properties, including the improvements, as part of its ongoing parks and recreation operations. City further agrees to maintain the open space land and the Park in accordance with the statutory requirements and the conditions of the conservation easement.

4. Duration and Termination. This Agreement shall take effect upon execution and terminate December 31, 2057.

5. Citizen Use. The City agrees to allow all citizens of Salt Lake County to use the open space land and the Park on the same terms and conditions as residents of the City.

6. Compliance with Internal Revenue Code for Tax-exempt Status of Bonds. The County and City recognize that the general obligation bonds issued by the County bear interest which is intended to be tax-exempt for federal income tax purposes. In order to assure compliance with the requirements of the Internal Revenue Code applicable to the tax-exempt status of interest on the bonds, the County and City hereby covenant and agree that no portion of the open space land or the Park will be used for any private business as defined in Section 141(b) of the Code. The County and/or City expect to continually own and use the open space land and the Park for general public use for the useful life of the open space land and the Park and at least as long as the bonds are outstanding.

7. Liability and Indemnification. Both Parties are governmental entities under the Governmental Immunity Act of Utah, Utah Code Ann. Section 63-30d-101, et seq. Consistent with the terms of this Act, it is mutually agreed that each party is responsible and liable for its own wrongful or negligent acts which it commits or which are committed by its agents, officials, or employees. Neither party waives any defenses otherwise available under the Governmental Immunity Act.

8. Interlocal Act Requirements. In satisfaction of the requirements of the Interlocal Act, and in connection with this Agreement, the Parties agree as follows:

a. This Agreement shall be authorized by resolution of the governing body of each party pursuant to Section 11-13-202.5 of the Interlocal Act;

b. This Agreement shall be reviewed as to proper form and compliance with applicable law by a duly authorized attorney on behalf of each party, pursuant to Section 11-13-202.5 of the Interlocal Act;

c. A duly executed original counterpart of this Agreement shall be filed with the keeper of records of each party, pursuant to Section 11-13-209 of the Interlocal Act;

d. Except as otherwise specifically provided herein, each party shall be responsible for its own costs of any action done pursuant to this Agreement, and for any financing of such costs;

e. No separate legal entity is created by the terms of this Agreement. To the extent that this Agreement requires administration other than as set forth herein, it shall be administered by the respective Mayors of City and the County. No real or personal property shall be acquired jointly by the Parties as a result of this Agreement. To the extent that a party acquires, holds, or disposes of any real or personal property for use in the joint or cooperative undertaking contemplated by this Agreement, such party shall do so in the same manner that it deals with other property of such party; and

9. Counterparts. This Agreement may be executed in counterparts by City and the County. In such event, a duly executed original counterpart shall be filed with the keeper of records of each party pursuant to the Interlocal Act.

10. Governing Law. This Agreement shall be governed by the laws of the State of Utah both as to interpretation and performance.

11. Entire Agreement. This Agreement contains the entire agreement between the Parties, with respect to the subject matter hereof, and no statements, promises, or inducements made by either party or agents for either party that are not contained in this written contract shall be binding or valid; and this Agreement may not be enlarged, modified, or altered except in writing, and signed by the Parties.

IN WITNESS WHEREOF, the parties have executed this agreement as of this 5th day of August, 2008.

SANDY CITY

Mayor

ATTEST:

City Recorder, Dep.

SANDY CITY, UTAH INCORPORATED 1893

Approved as to legal form and compliance with applicable law:

Attorney for Sandy City

SALT LAKE COUNTY

ATTEST

Mayor

County Recorder

Approved as to legal form and compliance with applicable law:

8-15-08

Attorney for Salt Lake County

7/30/08 MS

SANDY CITY APPROVALS

Department

Risk Mgt.

Budget

Legal Form Ree

Purchasing Compliance

IN WITNESS WHEREOF, the parties have executed this agreement as of this 5th day of August, 2008.

SALT LAKE COUNTY

BY: _____
Mayor Peter Corroon

APPROVED AS TO FORM AND LEGALITY:
SALT LAKE DISTRICT ATTORNEY

BY: _____ 7-10-08
Deputy District Attorney

SANDY CITY CORPORATION:

BY_____
Mayor Tom Dolan

ATTEST:

_____
Sandy City Recorder

APPROVED AS TO FORM AND LEGALITY:
SANDY CITY ATTORNEY

BY: _____

STATE OF UTAH)
: ss
County of Salt Lake)

On this day of 4 Aug, 2008, personally appeared before me Karen Suzuki-Okabe, who being duly sworn, did say that (s)he is the Deputy Mayor of Salt Lake County, Office of Mayor, and that the foregoing instrument was signed on behalf of Salt Lake County, by authority of law.

KAREN R. LOWE
NOTARY PUBLIC - STATE OF UTAH
2001 S. STATE STREET N-2100
SALT LAKE CITY, UT 84190
My Comm. Exp. 01/08/2010

[SEAL]

Karen R. Lowe
NOTARY PUBLIC
Residing in Salt Lake County

EXHIBIT A

10 ACRE OPEN SPACE PARCEL 28-26-100-001

The Northwest Quarter of the Northwest Quarter of the Northwest Quarter of Section 26, Township 3 South, Range 1 East, Salt Lake Base and Meridian, in Salt Lake County, Utah.

38 ACRE PARK PARCEL 28-23-351-004

The Southwest Quarter of the Southwest Quarter of Section 23, Township 3 South, Range 1 East, Salt Lake Base and Meridian.

LESS AND EXCEPTING THEREFROM:

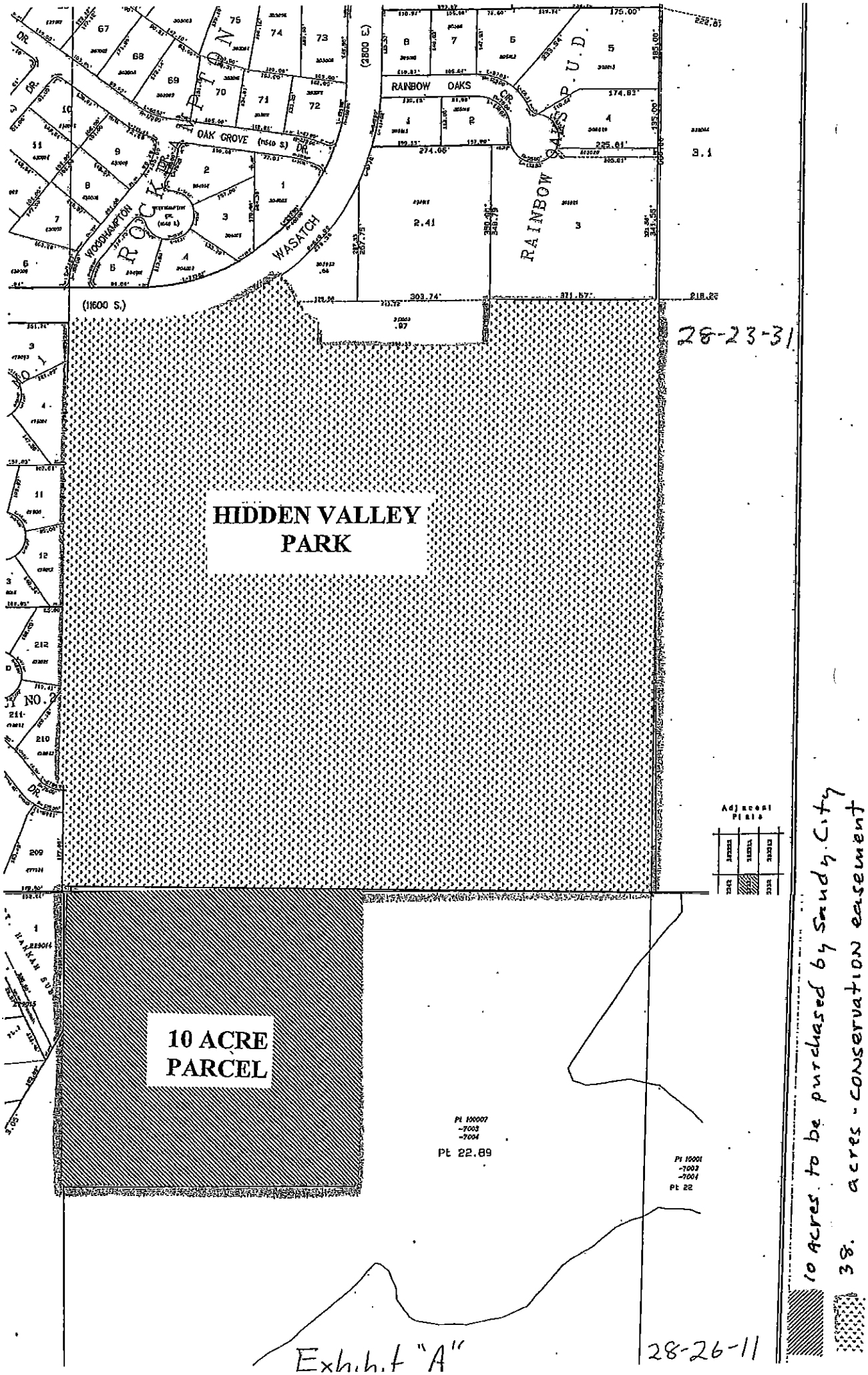
Beginning at the Southwest Corner of Section 23, Township 3 South, Range 1 East, Salt Lake Base and Meridian, said point also being the Southeast corner of Lot 209, Highland of Hidden Valley No. 2 Subdivision; thence North 0° 08'32" East 227 feet along the West line of said Section and along the East Line of said subdivision; thence Easterly 20 feet parallel to the South section line of said Section 23; thence South 0° 08'32" West 227 feet to the Section line; thence Westerly 20 feet along the Section line to the point of the beginning.

ALSO LESS AND EXCEPTING THEREFROM:

That portion of said property situated within Wasatch Boulevard.

ALSO LESS AND EXCEPTING THEREFROM:

BEGINNING at a point on the South line of the Northwest quarter of the Southwest quarter of Section 23, Township 3 South, Range 1 East, Salt Lake Base and Meridian, said point being North 0°08'04" East along the Section line 1324.75 feet and South 89°59'39" East along said South line of the Northwest quarter of the Southwest quarter of Section 23, 511.14 feet from the Southwest corner of said Section 23, and running thence South 89°59'39" East along the South line of the Northwest quarter of the Southwest quarter of said Section 23, 443.72 feet to a point on the West line of the Rainbow Oaks Subdivision as recorded with the office of the Salt Lake County Recorder, thence South 0°17'45" West 104 feet; thence North 89°59'39" West 390.33 feet; thence North 01°01'20" East 56.24 feet; thence Northwesterly along the arc of a 50.00 foot radius curve to the right (center bears North 05°35'06" East) through a center angle of 50°53'57" a distance of 44.42 feet to a point of curvature; thence North 33°30'56" West 30.84 feet to the point of beginning.


HIDDEN VALLEY PARK
10 ACRE PARCEL
RAINBOW OAKS
RAINBOW OAKS P.U.D.
OAK GROVE (1610 S.)
WOODHAMPTON
WASATCH
(11600 S.)
(2800 E.)
28-23-31
28-26-11
Pt 22.89
10 Acres to be purchased by Sandy City
38. acres - conservation easement
Exhibit "A"

RESOLUTION #08-52 C

A RESOLUTION AUTHORIZING THE EXECUTION OF AN INTERLOCAL COOPERATION AGREEMENT BETWEEN SALT LAKE COUNTY AND SANDY CITY TO ACQUIRE APPROXIMATELY 10 ACRES OF OPEN LAND ADJACENT TO THE CITY'S OWNED PROPERTY KNOWN AS THE HIDDEN VALLEY PARK FOR THE PURPOSES OF PRESERVING AS OPEN SPACE LAND AND TO COMBINE WITH THE PARK FOR USE BY THE PUBLIC.

BE IT KNOWN AND REMEMBERED that the City Council of Sandy City, State of Utah, finds and determines as follows:

WHEREAS, Title 11, Chapter 13, Utah Code Annotated 1953, as amended, permits public agencies to enter into cooperative agreements to provide joint undertakings and services; and

WHEREAS, the attached agreement has been prepared to accomplish such purpose.

NOW, THEREFORE, BE IT RESOLVED by the City Council of Sandy City, Utah:

1. It does hereby approve the attached agreement described as an interlocal agreement between the Salt Lake County and Sandy City to acquire approximately 10 acres of open land adjacent to the City's owned property known as the Hidden Valley Park for the purposes of preserving as open space land and to combine with the park for use by the public.

2. The Hon. Thomas M. Dolan, Mayor of Sandy City, is hereby authorized to execute the agreement on behalf of Sandy City Corporation and to act in accordance with its terms.

DATED this 5th day of August, 2008.

Scott Cowdell, Chairman
Sandy City Council

ATTEST:

City Recorder

RECORDED this 14 day of August, 2008.

County Contract No. SA08120C
District Attorney No. 2008-0557

INTERLOCAL COOPERATION AGREEMENT

between

SALT LAKE COUNTY

and

SANDY CITY

August ~~July~~ This Interlocal Cooperation Agreement ("Agreement") is entered into this 5th day of 2008, pursuant to the Utah Interlocal Cooperation Act, codified in Title 11, Chapter 13 of Utah Code Ann., as amended (the "Interlocal Act"). This Agreement is entered into by and between Sandy City, a municipal corporation of the State of Utah ("City"), and Salt Lake County, a body corporate and politic of the State of Utah ("County"). County and City are sometimes referred to as the "Parties."

WHEREAS, City owns certain real property known as the Hidden Valley Park ("Park") which park encompasses approximately 38 acres. Adjacent to the Park is approximately 10 acres of open land ("open space land") that the City desires to acquire for the purposes of preserving as open space land and to combine with the Park for use by the public. Further, as part of the acquisition, the County will acquire conservation easements encumbering the Park and open space land;

WHEREAS, the County issued general obligation bonds, in accordance with the Local Government Bonding Act, Title 11, Chapter 14, Utah Code, (the "Bond Act"), for the acquisition and preservation of open space and parks in Salt Lake County, either alone or jointly with another local political subdivision;

WHEREAS, City is a "local political subdivision" as defined in the Bond Act and has requested that the County use a portion of its general obligation bonds issued for the acquisition and preservation of open space and parks to finance the purchase of a conservation/preservation easement(s) to be owned by County;

WHEREAS, the 10 acres of open space land to be purchased by City possesses watershed, wildlife habitat, natural, scenic, recreational, educational, historical, geological, and open space values, of great importance to residents of the City and the County;

WHEREAS, the Park has significant recreational value to the residents of the City and the County;

WHEREAS, County and City have determined that it will be mutually beneficial and in the best interests of the residents of the County and City to enter into this Agreement to preserve the Park and open space land for the enjoyment of the public and all future generations; and

WHEREAS, the City and County have determined that the consideration agreed upon by the Parties is fair and equitable.

NOW THEREFORE, the County and City enter into the following agreement:

1. Project. The County and City agree to jointly cooperate in the development and enhancement of the 10 acre open space land, which property is generally described in Exhibit "A" attached hereto. The Parties further agree to jointly cooperate to preserve the open space land with a conservation easement to be owned by County. County and City further agree to jointly cooperate in the preservation of the Park which is generally described in Exhibit "A" attached hereto with the grant of a conservation easement to Salt Lake County also covering the Park.

2. Finance. The County agrees to pay to City the amount of $1,600,000 for the grant of a conservation easement (or easements) covering the open space land and the Park. Said conservation easement(s) will include the 38 acres and the 10 acres preserving both the open space land and the Park as open space for recreational and other appropriate uses. No County funds may be used to retire any debt incurred by City.

3. Ownership and Maintenance. The County and City agree that the County will own the Easements and City shall maintain the Properties, including the improvements, as part of its ongoing parks and recreation operations. City further agrees to maintain the open space land and the Park in accordance with the statutory requirements and the conditions of the conservation easement.

4. Duration and Termination, This Agreement shall take effect upon execution and terminate December 31, 2057.

5. Citizen Use. The City agrees to allow all citizens of Salt Lake County to use the open space land and the Park on the same terms and conditions as residents of the City.

6. Compliance with Internal Revenue Code for Tax-exempt Status of Bonds. The County and City recognize that the general obligation bonds issued by the County bear interest which is intended to be tax-exempt for federal income tax purposes. In order to assure compliance with the requirements of the Internal Revenue Code applicable to the tax-exempt status of interest on the bonds, the County and City hereby covenant and agree that no portion of the open space land or the Park will be used for any private business as defined in Section 141(b) of the Code. The County and/or City expect to continually own and use the open space land and the Park for general public use for the useful life of the open space land and the Park and at least as long as the bonds are outstanding.

7. Liability and Indemnification. Both Parties are governmental entities under the Governmental Immunity Act of Utah, Utah Code Ann. Section 63-30d-101, et seq. Consistent with the terms of this Act, it is mutually agreed that each party is responsible and liable for its own wrongful or negligent acts which it commits or which are committed by its agents, officials, or employees. Neither party waives any defenses otherwise available under the Governmental Immunity Act.

8. Interlocal Act Requirements. In satisfaction of the requirements of the Interlocal Act, and in connection with this Agreement, the Parties agree as follows:

    a. This Agreement shall be authorized by resolution of the governing body of each party pursuant to Section 11-13-202.5 of the Interlocal Act;

    b. This Agreement shall be reviewed as to proper form and compliance with applicable law by a duly authorized attorney on behalf of each party, pursuant to Section 11-13-202.5 of the Interlocal Act;

    c. A duly executed original counterpart of this Agreement shall be filed with the keeper of records of each party, pursuant to Section 11-13-209 of the Interlocal Act;

    d. Except as otherwise specifically provided herein, each party shall be responsible for its own costs of any action done pursuant to this Agreement, and for any financing of such costs;

    e. No separate legal entity is created by the terms of this Agreement. To the extent that this Agreement requires administration other than as set forth herein, it shall be administered by the respective Mayors of City and the County. No real or personal property shall be acquired jointly by the Parties as a result of this Agreement. To the extent that a party acquires, holds, or disposes of any real or personal property for use in the joint or cooperative undertaking contemplated by this Agreement, such party shall do so in the same manner that it deals with other property of such party; and

9. Counterparts. This Agreement may be executed in counterparts by City and the County. In such event, a duly executed original counterpart shall be filed with the keeper of records of each party pursuant to the Interlocal Act.

10. Governing Law. This Agreement shall be governed by the laws of the State of Utah both as to interpretation and performance.

11. Entire Agreement. This Agreement contains the entire agreement between the Parties, with respect to the subject matter hereof, and no statements, promises, or inducements made by either party or agents for either party that are not contained in this written contract shall be binding or valid; and this Agreement may not be enlarged, modified, or altered except in writing, and signed by the Parties.

EXHIBIT A

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LESS AND EXCEPTING THEREFROM:

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ALSO LESS AND EXCEPTING THEREFROM:

That portion of said property situated within Wasatch Boulevard.

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BEGINNING at a point on the South line of the Northwest quarter of the Southwest quarter of Section 23, Township 3 South, Range 1 East, Salt Lake Base and Meridian, said point being North 0°08'04" East along the Section line 1324.75 feet and South 89°59'39" East along said South line of the Northwest quarter of the Southwest quarter of Section 23, 511.14 feet from the Southwest corner of said Section 23, and running thence South 89°59'39" East along the South line of the Northwest quarter of the Southwest quarter of said Section 23, 443.72 feet to a point on the West line of the Rainbow Oaks Subdivision as recorded with the office of the Salt Lake County Recorder, thence South 0°17'45" West 104 feet; thence North 89°59'39" West 390.33 feet; thence North 01°01'20" East 56.24 feet; thence Northwesterly along the arc of a 50.00 foot radius curve to the right (center bears North 05°35'06" East) through a center angle of 50°53'57" a distance of 44.42 feet to a point of curvature; thence North 33°30'56" West 30.84 feet to the point of beginning.

EXHIBIT A

RESOLUTION NO. 4170 DATE July 15, 2008

A RESOLUTION OF THE SALT LAKE COUNTY COUNCIL AUTHORIZING AN INTERLOCAL COOPERATION AGREEMENT WITH SANDY CITY AND APPROVING NEGOTIATION, EXECUTION AND ACCEPTANCE OF THE GRANT OF CONSERVATION EASEMENTS FROM SANDY CITY

RECITALS

A. Sandy City has entered into an agreement to purchase approximately 10 acres of open space land generally described in Exhibit A to the attached Interlocal Agreement.

B. Sandy City also owns approximately 38 acres it now uses as Hidden Valley Park, which park is directly adjacent to and contiguous with the 10 acres of open space land being purchased by Sandy City.

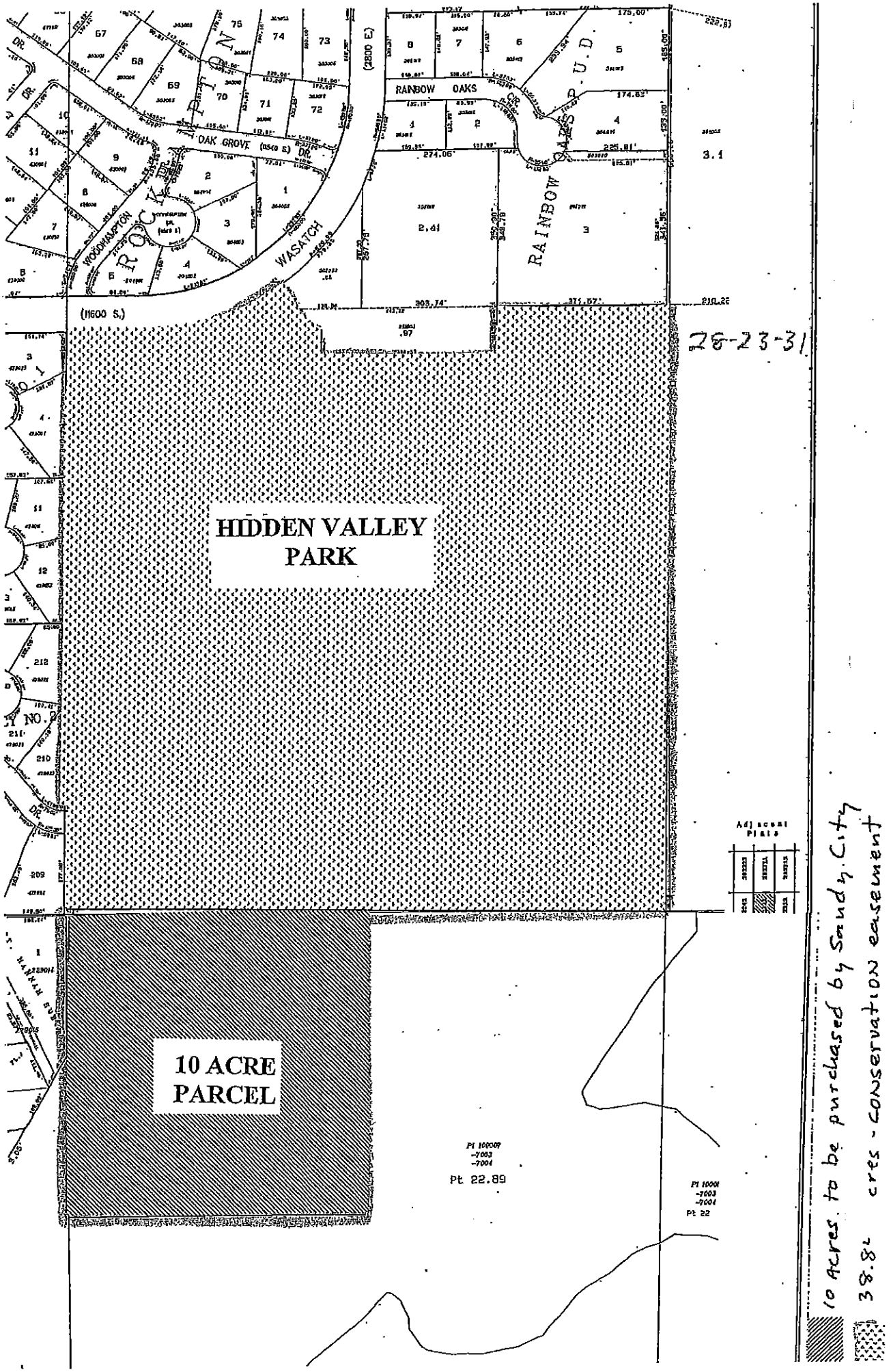
C. It has been determined that the 10 acre parcel to be acquired possesses watershed, wildlife habitat, natural, scenic, recreational, educational, historical, geological, and open space values, of great importance to residents of Sandy City and the residents of Salt Lake County.

D. It has been determined that the 10 acre parcel is a significant scenic, open space resource and its open space will allow for future development of the Bonneville Shoreline Trail.

E. It has been determined that Hidden Valley Park has significant recreation value and its recreation value is of great importance to the residents of Sandy City, and the residents of Salt Lake County.

F. Sandy City and Salt Lake County desire to cooperate jointly, pursuant to the Utah Interlocal Cooperation Act, to preserve these parcels for use and enjoyment as recreation area and open space for their residents and for future generations.

Exhibit A


HIDDEN VALLEY PARK
10 ACRE PARCEL
RAINBOW OAKS P.U.D.
RAINBOW OAKS
ROCKY POINT
OAK GROVE (1560 S.) DR.
WOODHAMPTON
WASATCH
(11600 S.)
(2800 E.)
28-23-31
3.1
2.41
Pt 22.89
Adjacent Plats
10 Acres to be purchased by Sandy City
38.82 cres - conservation easement

G. It has been determined that the best interests of the County and the general public will be served by paying Sandy City $1,600,000 for the City's grant of a Conservation Easement on the 10 acre parcel and the grant of a Conservation Easement on Hidden Valley Park. The grant of Easements shall be under the terms and conditions of the attached Interlocal Cooperation Agreement. The execution of said Agreement and Easements will be in compliance with all applicable state statutes and county ordinances.

NOW, THEREFORE, IT IS HEREBY RESOLVED by the Salt Lake County Council that the attached Interlocal Agreement is accepted and approved and the Mayor is authorized to execute the Agreement on behalf of Salt Lake County.

IT IS FURTHER RESOLVED by the Salt Lake County Council that the Mayor is authorized to negotiate the Conservation Easement over the 10 acre parcel and to negotiate the Conservation Easement over the Hidden Valley Park parcel on behalf of Salt Lake County and upon execution by Sandy City the Mayor, is authorized to accept the Easements from City on behalf of Salt Lake County.

APPROVED and ADOPTED this 15th day of July, 2008.

SALT LAKE COUNTY COUNCIL

By _____
Michael Jensen, Chair

ATTEST:

Sherrie Swensen
Salt Lake County Clerk

APPROVED AS TO FORM
Salt Lake County District Attorney's Office
By _____
Deputy District Attorney
Date 7-10-08

Council Member Allen voting	"Aye"
Council Member Bradley voting	"Nay"
Council Member Crockett voting	"Aye"
Council Member Hatch voting	"Aye"
Council Member Horiuchi voting	"Aye"
Council Member Hendrickson voting	"Nay"
Council Member Jensen voting	"Aye"
Council Member Wilde voting	"Aye"
Council Member Wilson voting	"Aye"

STATE OF UTAH)
:ss.
COUNTY OF SALT LAKE)

On this ____ day of _____, 200__, personally appeared before me _____, who being duly sworn, did say that (s)he is the _____ of Salt Lake County, Office of Mayor, and that the foregoing instrument was signed on behalf of Salt Lake County, by authority of law.

_____
NOTARY PUBLIC
Residing in Salt Lake County

[SEAL]

SURFACE FAULT RUPTURE REPORT

For

McDougal Property

Prepared by:

DAMES AND MOORE

24 May 1998

DAMES & MOORE

A DAMES & MOORE GROUP COMPANY

REPORT

SURFACE FAULT RUPTURE HAZARD EVALUATION PROPOSED MCDOUGAL RESIDENTIAL SUBDIVISION SANDY, UTAH

PREPARED FOR

MR. GARY MCDOUGAL

DAMES & MOORE

May 24, 1999

Project No. 42891-001-162

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

127 South 500 East, Suite 300
Salt Lake City, Utah 84102-1959
801 521 9255 Tel
801 521 0380 Fax
800 432 6375 Tel

May 24, 1999

Mr. Gary McDougal
Gary McDougal
McDougal & Olsen Construction, Inc.
11576 South State
Draper, UT 84020-9453

Report
Surface Fault Rupture Hazard Evaluation
Proposed Residential Subdivision
Located at approximately 2800 East and 11800 South
Sandy, Utah

INTRODUCTION

This report presents the results of our surface fault rupture evaluation for the proposed McDougal residential subdivision located at approximately 2800 East and 11800 South, in Sandy, Utah. The scope of work was outlined in our proposal, dated February 25, 1999.

The proposed development is an undeveloped parcel of land located vacant 10-acre parcel in the NW 1/4 NW 1/4 Section 26, T. 3 S., R. 1 E., Salt Lake Base and Meridian (Figure 1)). The site is approximately 10 acres in size. The site is bounded on the north by the undeveloped 40-acre parcel, on the east by the Wasatch Range, on the south by the Little Willow Creek drainage, and on the west by a residential subdivision on Cassowary Drive.

PURPOSE AND SCOPE

The purpose of the study was to evaluate the surface fault rupture hazard at the site and provide recommendations for design and development as required by Sandy City's development ordinances. More specifically, the goals of this study were to identify the presence and location of active faults in the immediate area of potential building pads, to assess the zone of fault-related deformation, and to recommend appropriate fault set-back distances and safe "buildable" areas should faults be discovered. This study combines new trenching information with previous work on the site.

In accomplishing the study purpose, the following services were performed:

(1) A site evaluation and reconnaissance conducted by an experienced engineering geologist to assess the surface fault rupture hazard at the site. The evaluation included a review of available data, interpreting aerial photographs of the site, and

(2) Excavating two new exploration trenches across the site to accurately locate the position of faults and help characterize fault rupture patterns.

(3) Initiating an office program that included the evaluation of available data, performing fault setback calculations, and preparation of this report that presents the results of our study and provides preliminary recommendations for site development.

PROPOSED DEVELOPMENT

The proposed development is a residential subdivision on 10 acres of undeveloped land. Details of the development are still in the planning stage; however, the homes are expected to be two to three levels with partial or full depth basements. Nominal footing depths are expected to be on the order of 8 feet below existing grade. Woodframe construction is anticipated and induced loads are expected to be relatively light.

GEOLOGIC SETTING

The surficial geology of the study area has been mapped by Personius and Scott (1992). Surficial deposits along the lower areas of the site have been mapped as Holocene to uppermost Pleistocene fan alluvium and Pleistocene Lake Bonneville deposits.

PREVIOUS WORK

A complex pattern of faults associated with the Wasatch Fault Zone has been mapped across the site by several previous studies (Nelson, 1989, Personius and Scott, 1992). These studies were regional in scale and identified the location of faults based on surface scarp morphology and aerial photography analysis; no subsurface exploration was used to confirm the actual location of faults.

Two previous fault-trenching investigations have been performed on the adjoining property to the north. The adjoining 40-acre parcel has been referred to as "Gobbler Farms" and "Hidden Valley Park". A study by Bingham Engineering (1991) identified the location of numerous faults in a trench just north of the site. A study by Delta Geotechnical Consultants, Inc. (1992) further defined the nature and location of active faulting with two additional continuous trenches. These previous studies provide good geologic evidence for the location and trend of active faults along the northern portion of the subject property and the location of the eastern, large scarp-forming fault.

A fault study was completed covering the northwest portion of the subject McDougal property by Delta Geotechnical Consultants, Inc. (1993). This study focused on excavating a trench (Figure 5 – Trench 1) about 250 feet in length. The log of the south wall of this trench is included as Figure 2.

Fault characteristics for Trench 1 are summarized in the following table:

TABLE 1 – TRENCH 1 FAULT CHARACTERISTICS

FAULT [1]	STRIKE and DIP	DISPLACEMENT [2]
1	N02E, 75E	.1 foot
2	N00E, 65E	>4 feet
3	N12E, 75E	.3.3 feet
4	N14E, 55W	.3.5 feet
5	N18E, 75W	>3.5 feet
6	N15E, 65E	.5.5 feet
7	N14E, 50E	>5.5 feet
8	N04E, 65W	>1 foot
9	N08E, 65W	>2.5 feet

[1] Refer to Trench Log (Figure 2) for Fault Numbers and Locations
[2] Minimum Offset Values Given When Matching Beds Not Observed

FIELD INVESTIGATION

To supplement the information from previous studies, two new trenches (Figure 2 – Trenches 2 and 3) were excavated and logged in early March 1999. These new trenches were positioned to determine if faulting passed through the potential building areas along the base of the main scarp.

The south wall of each trench was logged (scale: 1 inch = 5 feet) using a level line to insure accuracy. The maximum depth explored was about 15 feet. The depth of trenching varied depending on the extent of excavation required to penetrate Holocene sediments and to locate "marker beds" known to be at least 10,000 years old. The contact between Pleistocene (perhaps 15,000-16,000 years old given the elevation of this site) Lake Bonneville wave-laminated, gray sand and bedded gravel and Pleistocene/Holocene? massive to faintly-bedded, dark brown, sandy silt (graben fill?) provided an excellent marker bed throughout most of the length of the trench. The sharp contact between these two units generally appeared as a distinct cobble/gravel layer.

Two graben-forming faults were discovered in Trench 2. These faults are projected on Figure 5 to align with a similar structure formed by faults 4 and 5 in Trench 1. Other faults observed at depth in Trench 1 are mapped in Figure 5 as passing through Trench 2.

Trench 3 was excavated about 50 feet into the hillslope of the steep main scarp in an effort to locate the main trace of the rupture, but no evidence of the fault was observed. The location of the main trace of the fault as shown on Figure 5 is based on projecting the location of the fault from the Bingham Engineering (1991) study just north of the McDougal property. A large fault was also discovered at about 140 feet in Trench 3. This fault is mapped in Figure 5 as the projection of the eastern graben-bounding fault seen in the other two trenches. Given the relative ages of the units displaced, all of the faults observed in the trenches should be considered active. The characteristics of each fault encountered in Trenches 2 and 3 are shown on the trench logs.

The trench excavations were field checked by Ms. Darlene Batatian, Salt Lake County Geologist and Sandy City Planning and Engineering staff members. The south wall of both trenches was video taped for future reference.

No ground water was encountered in any of the trenches. Soils were dry with the exception of the topsoil which was slightly moist, probably due to the recent snowcover on the ground surface. Trenches were backfilled with stockpiled material and were not compacted.

CONCLUSIONS

Active faults, by definition, have ruptured the ground surface at least once in the past 10,000 years. Sediments and marker beds known to be older than 10,000 years and unfaulted conclusively demonstrate the absence of active faulting. Therefore, the unfaulted and non-deformed Pleistocene-age Lake Bonneville sediments and marker contacts exposed in areas of the three trenches provide a high degree of confidence that no active faults are present across portions of the subject site.

Most of the active faults discovered during this study can be correlated with faults mapped by the previous studies to the north and between the three trenches on the site. However, some of the faults observed in the previous study were not observed in the trench excavated in this study. The most notable of these are the 5 small-displacement faults in the area near the western graben-bounding fault. Given the field evidence it appears the pattern of fault rupture changes from north to south across the site. Some faults may vary in displacement along strike or perhaps may form en echelon ruptures between trenches. The fault map (Figure 5) is represents a conservative interpretation of fault traces across the site.

Surface fault rupture is the hazard related to differential movement of the ground surface along a fault during large earthquakes. Faults generating earthquakes with magnitudes of less than 6½ typically do not express rupture at the ground surface. Large earthquakes (magnitudes 7 to 7½) have been associated with over 6 feet of vertical surface rupture along normal faults. The pattern of faulting and deformation observed in the approximately 18,000 year sediment record at this site suggest that future fault rupture will likely be confined to the existing faults and future ground deformation will be similar in nature to that observed in the trenches.

In summary, if the following recommendations are taken into consideration in the layout of the proposed development, there are no fault-related constraints that would prevent the successful development of a residential subdivision on a portion of the site.

RECOMMENDATIONS

Based on our current understanding that surface fault rupture and deformation tend to follow past patterns, it is believed that the proposed dwellings can be constructed without undo risk from surface fault rupture as long as they are located some reasonable distance from the active faults.

The setback distance is determined by application of a standardized method developed by Batatian and Nelson (in press). The setback calculation is used to determine the required setback on both the upthrown and downthrown sides of the fault. The following equation is used to develop the recommended setbacks:

$$S = U(2D + F/\tan\theta) \qquad \text{Eq. 1}$$

Where S = Recommended Setback Distance,
U = Criticality Factor (based on the proposed occupancy of the structure, 1.5 for residential homes),
D = Expected displacement on the fault (based on past events),
F = Footing depth, and
θ = Dip of the fault.

Applying the setback formula using the fault characteristics from the trench logs provides the recommended non-buildable areas are delineated as the shaded zone on Figure 5.

The Lake Bonneville sediments observed in the non-shaded, "buildable" areas show no evidence of faulting or deformation since they were deposited over 10,000 years ago. In this same period there have been at least 3 (and perhaps 4 or 5) large surface-rupturing earthquakes along the Salt Lake Segment of the Wasatch Fault Zone. Based on this information and our current understanding that surface fault rupture and deformation tend to follow past patterns it is believed that residential dwellings may be constructed without undo risk from surface fault rupture or severe ground deformation if located out of the recommended fault setback area.

LIMITATIONS

The analysis and recommendations submitted in this report are based upon the data obtained from exploratory trenches. This report does not reflect any variations which may occur laterally away from the trenches. The nature and extent of variations may not become evident until the course of construction and are sometimes sufficient to necessitate changes in the location of a building pad; thus, it is important that we observe subsurface materials exposed in any building excavation to take advantage of all opportunities to recognize differing conditions which would affect the performance of the structure being planned.

This report has been prepared in order to assist Mr. Gary McDougal in selecting building pad locations. In the event that any changes are later made in the location of the buildable areas as outlined in this report, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or approved in writing by the engineering geologist. We also recommend that the final site plans be reviewed by our office to evaluate whether our recommendations were properly understood and implemented.

Excavation Backfill Considerations. The backfill was *not* placed in the trench in compacted layers. The fill is likely to settle with time and upon saturation. Therefore, no footings or structures should be founded on the trench sites until the trench backfill has been removed and replaced with structural fill, if the fill is to support a structure.

REFERENCES

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Delta Geotechnical Consultants, Inc., 1992, *Fault Investigation for Hidden Valley Park, 40-acre parcel, 2800 East 11700 South, Sandy, Utah*: Unpublished Consultant's Report dated September 11, 1992.

Delta Geotechnical Consultants, Inc., 1993, *Surface Fault Rupture Hazard Study, Proposed Residential Development Approx. 2800 East and 11800 South Sandy, Utah*: Unpublished Consultant's Report dated December 17, 1993.

Nelson, C.V., 1989, *Surface fault rupture and liquefaction potential special study areas map, Salt Lake County, Utah*: Salt Lake County Planning Division, Salt Lake City, Utah.

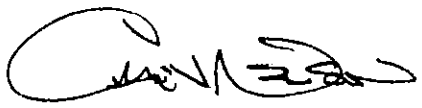
Personius, S.F., and Scott, W.F., 1992, *Surficial geologic map of the Salt Lake City segment and parts of adjacent segments of the Wasatch Fault Zone, Davis, Salt Lake, and Utah counties, Utah*: U.S. Geological Survey Miscellaneous Investigations, Map I-2106, scale 1:50,000.

The following Figures are attached and complete this report.

Figure 1 - Vicinity Map
Figure 2 - Trench Log – Trench 1
Figure 3 - Trench Log – Trench 2
Figure 4 - Trench Log – Trench 3
Figure 5 - Fault Map and Recommended Setbacks

Respectfully Submitted,

DAMES & MOORE



Craig V Nelson, C.E.G.
Certified Engineering Geologist
State of California

CURRICULUM VITAE

CRAIG V. NELSON, C.E.G., R.G.

Title

Senior Engineering Geologist
Principal

Expertise

Project Management
Engineering Geology
Hydrogeology
Geologic Hazards

Academic Background

M.B.A., Eccles School of Business, University of Utah, 1991
M.S., Geology, Utah State University, 1986
B.S., Geology, Utah State University, 1982

Registration

Registered Geologist - California (No. 4806) and Arizona (No. 26760)
Certified Engineering Geologist – California (No. 1585)

Experience

Mr. Nelson joined Dames & Moore in 1995 and serves as managing principal-in-charge of Salt Lake City operations. He has over 17 years of experience managing a wide variety of projects in engineering geology and hydrogeology. His expertise in geologic hazards mapping, analysis and mitigation stem from successful completion of numerous geologic hazard studies, fault and seismic investigations, rockfall probability assessments, landslide and debris flow studies, and slope stability projects. He has completed geologic studies and risk analysis for engineered structures, public facilities, subdivisions, dams, highways, and corridors throughout the western U.S. and Canada.

His environmental and hydrogeology work has included subsurface site characterizations, Phase I Environmental Site Assessments, and soil and groundwater remediation projects involving a variety of contaminants and remediation technologies. He has provided expert witness and third-party review services in a number of geology and ground water related cases.

- Project manager for the UDOT Stage I geotechnical investigation of the 17.6 mile segment of I-15 through the urban Salt Lake Corridor. This project involved CPT soundings and deep SPT borings, preliminary settlement analysis for bridge foundations and highway embankments, wick-drain analysis, and seismic microzonation of the corridor. Dames & Moore also prepared guideline manuals for subsurface, exploration, geotechnical analysis and design, and soil classification.
- Project manager for geologic and geotechnical exploration of the realignment of U.S. 189 in upper Provo Canyon, Utah. Provided detailed geologic maps, cross sections, and geologic hazards analysis including discontinuity and earthquake parameters for the transportation design engineers.

- Engineering geology analysis for proposed 945m long funicular railway system for ski resort access near Provo, Utah.
- Provided engineering geology analysis for the seismic stability evaluation of Twin Lakes (concrete arch) and Lake Mary (concrete gravity) dams. Project included detailed bedrock mapping of abutments, seismic refraction survey, and slope stability analysis.
- Performed the geologic site reconnaissance and seismic design criteria for the reconstruction and enlargement of an earthfill dam in Payson Canyon, Utah.
- Conducted numerous surface fault rupture hazard investigations for a variety of public and private structures and subdivisions.
- Developed a probabilistic risk assessment technique to determine the rock fall hazard at a corporate site in Ogden Canyon, Utah.
- Conducted geologic hazard assessments and geoseismic evaluations for a many public facilities, residential subdivisions, dams, highways, and industrial facilities.
- Evaluation of the debris flow potential and recommendations for mitigation following the Affleck Park wild fire in Emigration Canyon, Utah.
- Co-author of Salt Lake County's Natural Hazards Ordinance, which required developers to conduct special studies to address soil liquefaction and surface fault rupture in potential hazard areas.
- Project manager for environmental site assessment of property down gradient from chemical leach ponds at a Salt Lake City chemical company.
- Managed and directed numerous environmental site characterizations to determine extent and degree of soil and ground water contamination.
- Directed, reviewed or conducted over 50 Phase I Environmental Site Assessments for a variety of commercial and industrial facilities throughout the western U.S., Ireland, Scotland, Great Britain, and Singapore.
- Supervised UST removal sampling and preparation of closure plans.
- Provided senior technical review and client liaison for soil vapor extraction system in urban location. Site reached target cleanup levels in 3 months.
- Provided expert witness testimony and third-party review on a variety of geology and hydrogeology cases.
- Conducted ground water flow investigations for a major Utah gold mine project and a surface coal mine in New Mexico.
- Project geologist on over twenty mining engineering projects including: highwall slope stability analysis; subsidence evaluation; pilot shaft evaluation; portal and main entry stability analyses; ground control assessment; and geotechnical logging/testing studies.

Professional History

Sr. Engineering Geologist, Delta Geotechnical, Salt Lake City, UT (1992-95)
County Geologist, Salt Lake County Public Works, Salt Lake City, UT (1985-92)
Teaching and Research Assistant, Utah State University, Logan, UT (1983-85)
Staff Engineering Geologist, Seegmiller International - Mining & Geotechnical Engineers/Rock Mechanics, Salt Lake City, UT (1981-83)

Professional Awards

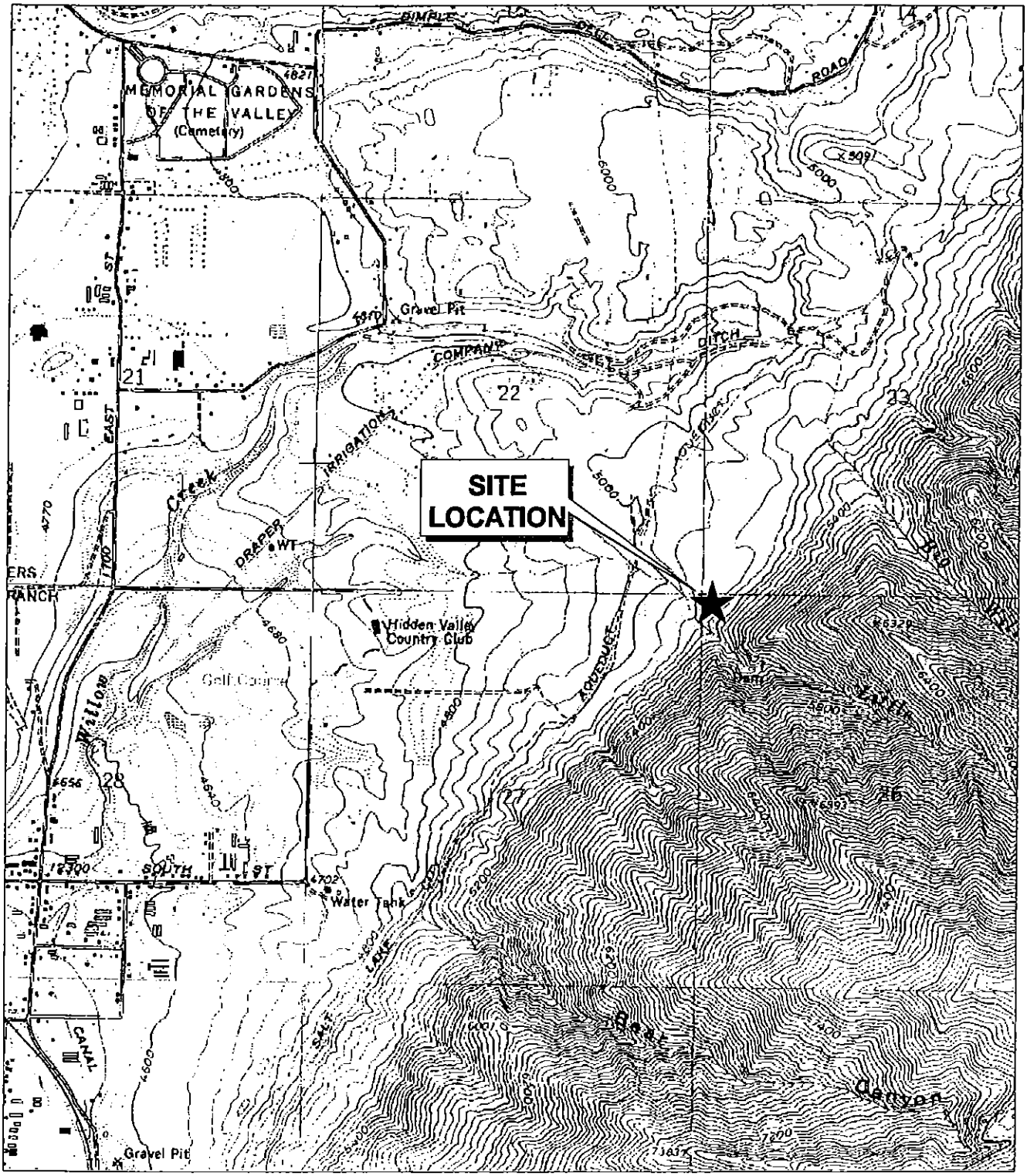
American Planning Association, *1991 Award of Merit* in recognition of achievement in information technology made to the state of Utah for the Earthquake Awareness and Hazard Mitigation Video.
American Planning Association: *1990 Award of Merit* for development of Salt Lake County's Natural Hazards Ordinance.
U.S. Geological Survey: *1989 Certificate of Appreciation* for implementation of measures to reduce losses due to earthquakes in Utah.

Professional Affiliations

Board Member, Utah Geological Survey
Member, Association of Engineering Geologists
Member, Geological Society of America
Member, Utah Geologic Association
Member, Salt Lake School District Seismic Committee, (1989-1992)
Member, Geological Review Committee, Nuclear Repository Waste Siting Study, Davis/Lavender Canyons, Utah (1982-1983)

Publications

Mr. Nelson has published over twenty articles and abstracts, primarily in the field of geologic hazards.



Source:
USGS 7.5 Minute Quadrangle
Draper, Utah,
1963 (photorevised 1969,1975)

VICINITY MAP

McDougal Fault Investigation

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

JOB NO. 42891-001-162

FIGURE 1

Date: 04/21/99

File: p:\mcdougal\mcdougal.apr

A Brief History of the Stanley Benjamin Neff Turkey Range

By Dr. Ty Harrison, Sandy Museum volunteer

Residence: 530 E. 8800 S. Sandy, UT 84070

Contacts: Telephone, 801-255-3167; email tyju@xmission.com

The Neff turkey range was located in what is now the Hidden Valley Park of Sandy City at the western base of Lone Peak which was referred to by local people as Mt. Jordan. The area was known as East Crescent for almost 100 years. Crescent was an unincorporated Salt Lake County town, between Sandy and Draper, reaching west to the Jordan River and having a population of approximately 500 in the mid 1950's. The turkey ranch area was located on the flats between the mouth of Big Willow Canyon on the north and Little Willow Canyon on the south. Just south of the mouth of Big Willow was the site of a 1800's portable sawmill which was built by Archibald Gardner of West Jordan fame. Logs were cut and hauled to the site from Big and Little Willow Canyons. The locally famous "log slide" scar is still visible from the area. The sawmill was later sold to Joseph M. Smith and James Jensen. The Parley Thompson families were also involved in the mill business. These were all early Draper residents. [See documentation in *People of Draper 1849-1924: History of Draper, Utah* vol. 1 (p.714) *Sivogah to Draper City 1849-1977: The History of Draper, Utah* vol. 2 (p. 133)]

The turkey range was used by Stanley (Stan) B. Neff from 1936 to 1955. It is unclear if he owned or leased the property. The turkey ranch operation involved the raising of young turkey at the historic Neff farm between 10000 S. and 10300 S. west of State Street, now the site of the Target store in South Towne Mall. When they were old enough the young turkeys were moved during the summer and fall to the net-fenced range and were guarded against predators (dogs, coyotes, etc) and thunder storms for 24 hours a day by young Crescent residents hired by Stan Neff. Before they were married both Lyle Gunderson and his wife Priscilla Robertson Gunderson, as well as Marie Robertson and Inez Thompson, all neighbors and Sandy and Crescent residents in the 1930's, were so employed (personal communication to Ty Harrison, 2009). The Neff farm on State Street was purchased by Benjamin Barr Neff from a Mr. Bell, possibly Philander Bell of South Jordan, who had homesteaded on Dry Creek about 1868. The original Neff home on State Street was adjacent to the historic Milo Andrus "halfway house" on the south which was moved in the 1980's to This is the Place Heritage Park, a Utah State Park. The area on both sides of Dry Creek, with a shallow dug well on the Neff property, was a famous stopping place for freighters going south along State Street. It was also along the Pony Express Trail and was the site of one of the first telegraph offices in the area. Neff's Station at Dry Creek, was run by telegrapher Mary Ellen Love Neff the second wife of Benjamin Barr Neff in the 1870's.

The Neff farm was also the site of the Fairdale Dairy from 1936 to 1942 (photo in the Sandy Museum), a partnership with Wells Jex Robertson, a neighbor on the east side of State Street whose farm is now Memorial Estates, a cemetery at 10200 S. State St.. During the time from 1936 to 1955 the Neff farm and summer turkey range was called the Neff Turkey Ranch. Stan's son Gordon Neff (deceased) helped his father run the farm and turkey operation, and later took

over the major responsibility.

In April of 1955 the Neff farm home and farm was sold to Sam and Marjorie Rudd who also raised turkeys for a number of years. It is not certain that the Rudd's used the turkey range area at the foot of Lone Peak. The farm was later sold to the developers of South Towne Mall in the 1980's and almost all of the Neff farm was destroyed. The only remaining evidence is in the form of Neff's Grove, an area along the course of channelized Dry Creek as it moves across the South Towne property. Using native plant species, Sandy City has landscaped a semi-natural area and trail here. This urban park open space in the middle of South Towne Mall memorializes the Neff family and the early residents of Dry Creek, which was later called Crescent, and finally becoming part of Sandy City. Some of the maturing trees along the old Dry Creek channel were established from seeds of mature trees in Neff's Grove after the hundred-year floods of 1983 and 1984, prior to the South Towne Mall construction [Dr. Ty Harrison, personal observation]. The Neff farm fields bordered both sides of Neff Grove, an important pioneer period recreation site for the early Dry Creek and Crescent residents.

Some of the above history was taken from the *History of Crescent*, by Grace Brown Johnson, a Daughters of the Utah Pioneers publication and *Neff History in Crescent, Utah 1868-1955* compiled by Faye Neff Brady (unpublished manuscript with photos, etc.), copie of both in Sandy Museum files, and personal notes and observations of Dr. Ty Harrison who grew up in the Crescent community and who knew Stanly Neff, his wife Grace and their children.

Little Willow Natural Area

Dr. Ty Harrison's field notes of April 12, 2009, and June 14, 1990

Contacts: Telephone 801-255-3167; email tyju@xmission.com; web site http://people.westminstercollege.edu/faculty/tharrison/index.html

The area is south of and adjacent to Sandy's Hidden Valley Park. This area is at the mouth of Little Willow Creek as it spills over the Bonneville Shoreline. The area was recently purchased as an addition to Hidden Valley and the extension of the Bonneville Shoreline Trail. Here is a Goggle Earth orientation map which shows the area.

Field Notes (April 12, 2009):

A. A number of noxious weeds were noted immediately south of the boundary fence on the flat terrace of the East graben. These include Dalmatian Toadflax (*Linaria dalmatica*), Hounds Tongue (*Cynoglossum officionale*), and Spotted Knapweed (*Centaurea maculata*). These weed are illustrated on Salt Lake County Weed web site: http://www.weeds.slco.org/ and by law are required to be controlled by the land owner. In addition chicory (*Chicorium intybus*) is also present among the noxious weed and should be controlled as well. There are probably more noxious weed on disturbed areas of the Hidden Valley Park site which need control as well. The most effective control method is hand spot spraying of a broadleaf herbicide by an individual trained to recognize the basal rosettes of the weeds when they are not flowering. I would be willing to train such an individual once they are identified.

B. There is a heavy invasion of both Cheatgrass (*Bromus tectorum*) and Annual Rye (*Secale cereal*) in this disturbed area. It is well known that Annual Rye is allelopathic and chemicals from the decomposing stems and litter inhibit the germination of seeds of other species, leading to the total domination of areas unless controlled. Application of a pre-emergent herbicide in late August or early September will control these annual cool season grasses which germinate with the first fall rains. This treatment will allow the recovery of the more valuable, native perennial wildflowers and grasses such as Sandy Dropseed (Sporobolus cryptandrus) which are here on the site. These pre-emergent herbicides are available from a local supplier such as Steve Regan in South Salt Lake. I suggest the spray application of a liquid formulation of Dimension EW, a Dow product for winter annual weedy grasses. One half gallon costs $187.69 and will treat 3 acres. This would be a rather cheap experiment to see if these annual grasses can be controlled by this commercial product typically used on golf courses to control annual weeds.

C. Dalmatian Toadflax occurs along the new Bonneville Shoreline Trail south of the Little Willow Creek crossing and should be controlled before it spreads.

D. The beautiful native Broadleaf Penstemon (*Penstemon platyphyllus*) grows along the trail which crosses the creek. It has green, expanding buds at this date. South of the crossing the Bitterbrush along the trail has been heavily browed by deer this past winter. Spring Beauty (*Claytonia lanceolata*) is currently in flower together with the

Annual Stoneseed (*Lithospermum arvense*) among the Bluebunch Wheatgrass (*Pseudoroegneria spicatum*) a native bunchgrass. The wild onion (*Allium acuminatum*) is here and possibly the state flower, the Sego Lily (*Calochortus nuttallii*). The Mallowleaf Ninebark (Physocarpus malvaceous) and many other native shrubs are here on a moist north-facing slope above the trail.

E. A 25 X 25 yard circular population of Money Plant (Lunaria annual) is located just below the Shoreline trail leading southward underneath the shade of oaks. This plant is an ornamental which is escaping from cultivation along the Wasatch foothills. It was were probably introduced during construction of the trail since the plants are 100 yards removed from the subdivision below. The plants could be easily controlled by a broadleaf herbicide application to the first year rosettes.

Summary: I have been observing the Little Willow Natural Area for over fifty years. It is a valuable foothill wildflower garden and a destination for future natural history field trips. It is a major amenity for all residents of Sandy City since it is so accessible from the Hidden Valley Park facility. The only management it needs is periodic litter removal and control of noxious weed species. I would be willing to conduct a more detailed ecological inventory of the area which would list all of the plant species on the property and describe the common plant communities and make management recommendations.

List of Plants Flowering on June 14, 1990

Shrubs: Mallowleaf Ninebark (*Physocarpus malvifolius*)

Red Osier Dogwood (*Cornus serecia*)

Ocean Spray (*Holodiscus discolor*)

Thimble Berry (*Rubus parviflora*)

Red Raspberry (*Rubus idaeus*)

Wildflowers:

Yellow Avens (*Geum macrophyllum*)

Richardsons Geranium (*Geranium richardsonii*)

Cow Parsnip (*Hieraceum lanatum*)

Horse Mint (*Agastache urticilifolia*)

Miners Lettuce (*Montia perfoliata*)

Woodland Star (*Lithophragma parviflora*)

Wild Onion (*Allium acuminatum*)

Broadleaf Pensetmo*n (Penstemon platyphyllus*)

Little Alumroot (*Heuchera parvifolia*)

Red Alumroot (*Heuchera rubra)*

Scorpion Weed (*Phacelia heterophylla*)

Yarrow (*Achillea millefolium* var. *lanulosa*)

Broadleaf Clarkia (*Clarkia rhomboidea*)

Western Hawkweed (*Hieraceum occidentalis*)

Hidden Valley Park Conservation Area Interpretive Loop Trail Design Recommendations

Dr. A. T. Harrison, Feb 4, 2010

Purpose: Visitors to Sandy's Hidden Valley Park can use this new, self-guiding interpretive tail to learn about and identify the common native plants and animals typical of the Wasatch Mountain foothills. Since the area was acquired with Salt Lake County open-space bond monies, they can see what the public gains by protection of nature at the urban/wildlands interface. This allows city dwellers easy access to nature.

Design: The trail into and through the newly acquired conservation area at the mouth of Little Willow Canyon has been designed as a loop to be entered from either of two points from the existing asphalt trail in Hidden Valley Park. There will be two small entry signs at the edge of the asphalt path directing visitors to a narrow, wood-chipped pathway passing through an existing pole fence which marks the northern perimeter of the conservation area.

Entry Points: There will be two large orientation entry signs mounted near the existing fence gateways. The lower one titled: **Little Willow Canyon** at the west entry will provide an orientation to the mouth of Little Willow Canyon, its geology and ecology. The upper one titled: **Geology of the Wasatch Fault** will provide an overview, to the north, of the double segment, graben valley created by the last movement of the Wasatch fault here in the park. This flat site, located just south of the existing pole fence, can be a gathering place for small groups to look over Hidden Valley Park to see the remarkable fault scarps now being slowly covered by vegetation. The alluvial debris fan at the mouth of Big Willow Canyon and part of the trail up Big Willow is visible in the distance. Also visible farther to the north is the Pleistocene glacial moraine of Bells Canyon. From here, one can view the spectacular truncated spurs of bedrock at the base of Lone Peak which have been created by past fault movement.

Suggested wording for the west entry orientation sign:

Little Willow Canyon: Welcome to the Hidden Valley Conservation Area Interpretive Trail near the mouth of Little Willow Canyon. This area was purchased with Salt Lake County open space bond and Sandy City tax funds. This is an important geological and wildlife habitat area. Here are native plants and animals, This is their home, treat them with respect. The mouth of Little Willow Canyon is visible to the southeast with cliff of Pre-Cambrian metamorphic quartzite of the Big Cottonwood geological formation approximately 0.9 billion years old. These ancient rocks have been exposed here by the up-thrusting action of the Wasatch Fault. By contrast, the igneous granitic rocks of Lone Peak, deposited here at the Bonneville Shoreline by erosion are only about 30 million years old. An evergreen coniferous forest of Douglas Fir and White Fir occupy the cool, shaded north-facing slope at the canyon mouth. A shady, Bigtooth Maple forest occupies the canyon bottom and thickets of Gambel Oak surround the area.

Suggested wording for the east entry orientation sign:

Geology of the Wasatch Fault: This overview, looking to the north, provides a spectacular view of the most recent movement of the Wasatch Fault which has formed Lone Peak to the east. Two fracture lines split the shoreline sediments of Lake Bonneville and we can see both steep fault scarps partially covered by oaks and other vegetation. This slippage toward the west forms what is called a graben valley, or depressed area in which the Sandy's Hidden Valley Park and paved trial has been created. Above to the east one can see the triangular shaped bedrock between Little Willow Canyon and Big Willow Canyon. These are call fault block truncated spurs, the angle of which defines the Wasatch Fault. A series of these spurs continues northward along the base of Lone Peak. Unconsolidated sediments of Lake Bonneville at the mouth of Little Willow Canyon, seen just to the east, were down-dropped and you are standing right on top of them. Look around for rounded or flattened beach-polished stones when this was the shoreline of Pleistocene Lake Bonneville, 14,500 years ago.

Self-guiding Interpretive Trail: The following self-guiding interpretive stations will be marked by a series of low profile (3 ft.), anchored, 4 X 4-inch natural weathering cedar posts with slant-cut tops and routed and stained numbers. The numbered interpretive stations will correspond to a web-site down-loadable map and interpretive brochure which can have illustrations to aid in identification. For the suggested trail markers see attached map.

Interpretive trail post marker sites draft narrative (proceeding counter clockwise starting at the west entry gate):

1. Little Willow Canyon Orientation (wordage in above paragraph).
2. Native Grassland
3. Wildlife Grove
4. Oak/Maple Grove
5. Birds and Trees
6. Native Shrubs
7. Wasatch Fault Overview (wordage in above paragraph)

Hidden Valley Conservation Area

Feb. 4, 2010. Field Notes and Recommendations: A. T. Harrison

Site visit and report recommendations contribution: Approximately ___7+__ man hours

Maintenance Issues and Future Projects

1. **Casowary Drive Turn Around Project**. This area was reseeded with Smooth Brome and Sheep Fescue grasses after it was constructed approximately 3-4 years ago. The fill area has been re-colonized by Big Sagebrush seedlings and other natives such as Sand Dropseed, Hairy Golden Aster and Curly-cup Gumweed. However there is invasion by weeds such as Wildrye, Cheatgrass, Dalmatian Toadflax and Cranesbill which need to be controlled. There is an opportunity here for an Eagle Scout project which could re-channelize the runoff water to irrigate a new, 60 yard circular planting of wildlife browse shrubs such as Curl-leaf Mt. Mahogany, Birchleaf Mt. Mahogany and Bitterbrush. These would not need supplementary irrigation if they were planted in the fall.

2. **Debris Piles**: There are approximately 4-7 low debris piles of soil and rocks located on both sides of the pole fence where the west trail entry will be located. Another old dump area is located in the Wildlife Grove area along the new interpretive trail loop (see map). The piles are currently covered by exotic weeds and need to be removed and the rock salvaged. The soil could be easily moved by a small front-end loader and could be used to construct and smooth a 3 foot wide entry trail from the existing asphalt paved loop trail. Any disturbed soil along the new trail loop or debris pile footpints would need to be reseeded by hand during the fall with a custom native seed mix (see following recommendations)

3. **Custom Grass Seed Mix for Hidden Valley Conservation area:** The following list of native grass and forbs is taken from observations of species growing in the immediate area. They are listed in decreasing order of ecological abundance. Such a custom seed mix with appropriate seed weight and number can be obtained from Granite Seed Company of Lehi, Utah.

   Grasses: Sand Dropseed (*Sporobolus cryptandrus*)>Purple Threeawn (*Aristida purpurea*)>Western Wheatgrass (*Pascopyrum smithii*)>Indian Ricegrass (*Stipa hymenoides*)>Needle-and-Threadgrass (*Hesperostipa comata*)>Sandberg Bluegrass (*Poa secunda)*>Bluebunch Wheatgrass (*Pseudoroegneria spicata*).

4. **Areas requiring native reseeding**: 1. Debris pile removal areas north and south of the existing pole fence and weedy areas around the Wildlife Grove and Oak/Maple Grove areas of the new interpretive trail (see map). 2. All disturbed areas along the new

Hidden Valley Conservation Area Interpretive Loop Trail.

5. **Noxious Weed Control**: An existing population of Spotted Knapweed (Centauria maculosa) on the conservation area site on the north side of the proposed Wildlife Grove interpretive site needs to be controlled by hand sprayer-applied, broadleaf herbicide. Dalmatian Toadflax is also scattered across the area and needs similar, spot-spraying control.

6. One of the most important weed control issues in Sandy's Hidden Valley Park is the control of Annual Wildrye (*Secale cereal*). This invasive grass is known to be allelopathic, which means that chemicals in the leaves and stems and possibly roots of these annual plants, leach into the soil and prevents the germination of native plant seeds. The fall germination and vigorous spring growth of the wild rye plants out complete native grass and wildflower seedlings as well as mature, established plants, allowing the rye to dominate the sites. Over the last twenty years, Wild Rye has been taking over disturbed areas in Hidden Valley Park and other areas in Sandy. Prior to this Cheatgrass (*Bromus tectorum*) had invaded and taken over the Hidden Valley Park area when it was highly disturbed by private use as a turkey farm summer range.

   A highly successful way to begin combating these introduced annual grasses is to treat the area in late summer, prior to fall rains, with a pre-emergent herbicide which prevents the germination of the seed already in the soil. It is proposed that Sandy City Parks Maintenance treat several acres on the south end of Hidden Valley Park to see if a water-applied, pre-emergent herbicide can be used to control both Cheatgrass and Annual Wild Rye. If successful this treatment could be used in the future to control weedy annual grasses in the adjacent conservation area.

   One possible herbicide is Ronstar Web links:
   http://www.sepulvedabasinwildlife.org/pdf/Growth%20of%20Stipa%20Pulchra.pdf
   Restoration in Calif. Stipa grassland, pre-emergent herbicides Ronstar and Eptan were used for transplanted grasses in pots to control weeds, among other treatments.

   Ronstar pre-emergent herbicide use

   http://www.bayeres.com.au/es/products/productdetail.asp?id=28

   note: this is an Australian company

   Regal Ronstar registration label: http://www.regalchem.com/components/lrglrnac.pdf

   http://www.nuturf.com.au/new%20design/turflabels/herbicides/Chipco%20Ronstar%20G.pdf

   There are a series of pre-emergent herbicides, both granular and water soluble which could be used to control Cheatgrass and Annual Rye but most are registered for use in turfgrasses and other applications.